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PROBLEMS OF SCHOOL HYGIENE

BEING A REPORT OF THE FIRST CONFERENCE
OF SCOTTISH SCHOOL MEDICAL OFFICERS

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OF SCOTTISH SCHOOL MEDICAL OFFICERS

68914

EDITED BY

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AND

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INTRODUCTION.

THE Conference of School Medical Officers, held at Edinburgh on the 1st and 2nd May, 1913, was the first of its kind held in Scotland. It was called together at the instance of officers of the Scotch Education Department. It contained representatives from every part of Scotland. There were some seventy delegates. These were sent by the School Boards of the large burghs and the County Education Committees. The response of those bodies to the suggestion that a conference should be held was of the most gratifying kind. There were doctors from as far north as Orkney and from as far south as Wigtownshire. But the Conference was not confined to school medical officers. It included representatives of all the medical services involved in the work of education in Scotland. Thus the medical lecturers at the Provincial Training Centres occupied a prominent place in the discussions, as they do in the medical work of the teaching profession. There were also representatives from the Central Institution for Physical Training at Dunfermline, the only institution of its kind in Scotland. Nearly all the county medical officers concerned in the school medical service were present too. The result was a meeting of the first importance to the health movement in Scotland.

Nor was the attendance limited to medical men. There were present several of the School Inspectors of the Scotch Education Department. Only those familiar with the history of the development of the movement towards the better medical supervision of teachers and school children can appreciate the full significance of the work done by the Inspectors of Schools in the organisation of the splendid educational medical service now established. None of these

gentlemen took any part in the discussions; but their presence was of the first importance in the promotion of the good understanding that should exist between the Department and all the local services.

On the second day of the Conference, in opening the morning session, Sir John Struthers, K.C.B., Secretary of the Scotch Education Department, expressed in considerable detail his views on the value and significance of the medical inspection movement, and the gratification of the Department at thus meeting for the first time the medical men engaged in the work.

The note of the Conference was synthesis. Of this the programme itself is a proof. It arranged for a series of discussions on problems of primary and passing interest. It made manifest that the whole education medical service is a unity—a point emphasised strongly by Dr. Carstairs Douglas. From the hygienic training of teachers at the one end to the detailed inspection of children at the other, there is perfect continuity of work and method. The representative papers, no less than the supplementary discussions, all showed that the various sections of the education medical service melt into one another in the most intimate way. Thus, the hygiene of the schools, including the structure of a school, is related to the work of teachers, of children, and of school medical inspection. No less fundamental is the individual health of the teachers. Hence the medical examination of entrants to the teaching profession was an essential part of the programme. But the training of teachers begins with the junior student. His health, therefore, merges in the general work due from the medical inspector. Medical inspection has, as a necessary, practical consequence, to be followed by treatment of the children inspected. All these phases of work furnish material for medical research at schools. Consequently, hygiene, individual examination of teachers and pupils, treatment and research, all hang together as departments of school medical work.

But perhaps the most novel part of the programme was

the place given to the medical aspects of physical education. In Dr. Cruickshank's paper no less than in the demonstrations that followed it, physical education was expounded as an integral part of any school medical service. This is a departure of great significance. It means that henceforward the school medical service must accept responsibility, not merely for the treatment of the diseases discovered, but equally for all the preventive methods available through personal hygiene and physical education. How rich the possibilities in this direction are was made manifest in the two hours' demonstration at the College of Hygiene and Physical Training, Dunfermline. To many medical men present, the possibilities of personal hygienic training was a revelation. From the awkward movements of the infants, through the various grades of school life, up into the higher training of the students of the college, the progress was shown to be continuous. Hitherto we have been so accustomed to physical "drill" that we have not fully realised how completely the conception of drill has been absorbed into real "education." Henceforward we shall hear less about physical training and more about physical education. The change in terminology is really a change in doctrine. For it is now obvious that physical education is as much a mental process as the learning of languages or the solution of arithmetical problems. It is seen, too, that personal growth depends on the soundness of the methods followed in physical education. The demonstration at Dunfermline was undoubtedly a fine feature of the Conference. No doubt the facilities at Dunfermline are in every respect exceptional; but what is there done on the large scale may be realised on the small scale in every school. And the school medical service will now naturally include a more thorough supervision of physical education.

There are many other things that this Conference suggests; but it is necessary only to emphasise the importance of keeping together the official health organisations of the country, of maintaining the closest interchange of ideas between the administrative and the clinical sections, of specialising in

every useful direction without sacrificing unity of purpose and correlation of results.

It is to be hoped that this Conference is the first of a series; for it has demonstrated in a hundred little ways the value of bringing the Central Department into touch with the local officers, so spreading through the whole service a spirit of good understanding and friendly co-operation.

W. LESLIE MACKENZIE.

January, 1914.

I.

THE IMPORTANCE OF MEDICAL INSPECTION.

By Sir JOHN STRUTHERS, K.C.B., LL.D.

SIR JOHN STRUTHERS was cordially welcomed by the chairman, and gave a brief address. At the outset he expressed the thanks of the Department to Dr. Leslie Mackenzie and Dr. Cruickshank and others, who had assisted in bringing about that most important conference. It was, he said, of the utmost importance to ladies and gentlemen in their position working in their own districts in what was virtually a new aspect of education to have frequent opportunities of meeting with each other and exchanging views and not getting into an isolated way of looking at things from the point of view of their own districts without criticism and correction from others who might see things from a rather different angle. Alluding to medical inspection, he expressed his personal strong belief in the importance and value of the system which had now been initiated and his fervent hope for its further advancement. They might confidently look forward to improvement not merely in the health of the children, but in their efficiency in future life, the saving of life, the making more efficient of the future citizen for work, and he hoped by and by the decline in poverty due to inefficiency, and the decline of sickness which made such claims on the life of men in all classes, and particularly the working classes. The institution of medical inspection was of very great importance from another point of view. They were all coming more and more to realise that all their educational theorising was more or less futile unless they started from the physical

6 IMPORTANCE OF MEDICAL INSPECTION.

basis, and he had no doubt that the results of years of work of medical inspection and the consideration of the information which they obtained in that way would give them a sounder educational system, better based on knowledge of the facts of child life, both physical and psychical. He had looked through a good many medical reports from various districts. He had seen most admirable general remarks on various aspects of education, with which he personally strongly sympathised, but he was not sure always that beyond the general statement of those views anything was being done to bring those views to concrete bearing upon the schools. He had seen some excellent remarks upon the dangers of fine sewing for young children, even for children under twelve. It was most excellent to have that view stated on the authority of capable medical men, but it was also very important that the actual work was investigated from that point of view to see whether the general precepts so soundly expressed were being observed in actual work. He had seen in some reports a complete statement of the condition of the schools in their districts, with remarks upon ventilation, lighting, and other matters.

CO-OPERATION OF OFFICERS AND INSPECTORS.

That again was most valuable, and he was glad to say that he had seen in several reports that these defects had been looked at in the course of the year, and the officer reporting was able to say that many had been remedied since his previous visit. A great many, unfortunately, were left unremedied, and it was very important that they should go on pegging away until these defects were wiped out. He had no doubt they would be able to accomplish that by methods of persuasion. They could not drive people at the point of the bayonet. The time came when there were certain defects of school premises which undoubtedly interfered, not merely with the health of the children, but the efficiency of the work. It was imperative these should be put right. It was rather a difficult matter for the medical officer to bring about improvement in school premises when

the local authority was reluctant or recalcitrant. In such cases he would strongly suggest communication with the inspector of schools in the district, and the importance from both points of view of the school inspector getting into thorough touch with the school medical officer of the district, and the medical officer getting into thorough touch with His Majesty's inspector. The school inspector had very definite powers under the Code, and if, after consultation with him, they agreed something ought to be done, he would help them, and bring about the desired result in perhaps a more expeditious way than was otherwise possible. He suggested the desirability, if possible, of arranging occasional conferences between the two classes of officers. He was entirely with Dr. Campbell Munro, who read a paper the previous day on school hygiene, in his desire for improvement and economy in building of schools. In conclusion, he said that no doubt the medical officers from their knowledge of the schools could afford great assistance, and it might be very useful if the conference would appoint a small committee of medical officers to consult with some of the inspectors and the Department architect as to what changes in the premises suggested were desirable. (Applause.)

II.

THE SOCIAL SIGNIFICANCE OF MEDICAL INSPECTION.

By W. LESLIE MACKENZIE, M.A., M.D., LL.D., Medical Member of the Local Government Board for Scotland.

It is only ten years since the Physical Training Commission (Scotland) made its report. Yet the system of medical inspection is already established and old. Ten years ago there was not in the whole of Scotland one medical inspector of a School Board school, or perhaps only one. To-day there are 105 medical men engaged in this work, giving to it their whole time or part of their time. That is the fact that brings us together. Let us look at the fact in its social significance.

The year 1890 is an important date for this meeting. It was then that the first whole-time county medical officer of health in Scotland was appointed. He was appointed in October, 1890. His name is the first name on our programme to-day, Dr. Campbell Munro. He came back to Scotland from a progressive English town. He was a pioneer in the public health movement in Scotland. His presence on our programme shows that he is still among the pioneers. But to Dr. Munro it was easy and natural to be so; for from the beginning he regarded the school and the school child as offering some of the most important problems in the whole range of public health, and there is nothing in our programme of discussions that lies outside the range of his interest and sympathy.

There are others of the men appointed almost at the same time who have spent over twenty years of strenuous

and persistent labour in preparing the way for the special work made possible under the new powers of the education authorities. One of them, Dr. Maxwell Ross, opens our last discussion. I for one do not believe in splitting up life into watertight compartments, each reserved and labelled as a particular specialism. In the city of ideas there are no "ticketed houses." We believe in the catholicity of medical culture and in the continuity of medical culture with life in all its phases. Specialism of function is necessary to social medical work; but watertight specialism is the death of administrative sanity and proportion. Because a man can examine eyes he is not therefore disqualified for examining ears, and if he knows the sound of the heart he is not therefore disqualified for hearing the sounds of the lungs. If he knows scarlet fever he is not therefore disqualified for recognising tuberculosis. There is nothing to be gained by dissociating one specialism from another. Each has its function, but all belong to the one world of ideas. In this conference we have every chief specialism represented; but the general standpoint is never forgotten, and there is no fundamental opposition between the medical officer of health and the medical officer of schools, nor between the eye-man and the ear-man, nor between the bacteriologist and the clinician. Each has his own aspect of the child to consider, but each has to remember every other aspect in its degree. Watertight specialism tends to run into pretentiousness, and pretentiousness runs into humbug, and humbug runs into quackery. In our system of school medical inspection there is room and need for many specialisms, but none of them is independent. The test of each is how far it promotes the total health and efficiency of the individual child, who is a living creature with eyes, ears, throat, skin, heart, lungs, and nervous system; and what is of equal importance, with a home, where he sleeps, and feeds, and keeps in touch with the flowing life of the family. The business of our system of inspection and treatment is to organise all our specialisms for his good.

Consider for a moment the complexity of the school medical

service as it actually stands. It responds on the whole to the complexity of the problems concentrated in the school and the school child. It contains medical officers of health, themselves representing the application of health ideas to the whole range of social life. It contains physiologists, who are engaged in the teaching of the fundamental conditions of health to the teachers in training. It contains pathologists, who are constantly occupied in examining pathological specimens and products with a view to the extirpation of disease. It contains general medical clinicians, who are skilled in the detection of the first beginnings of departures from the normal. It contains medical statisticians, who are accumulating numerical quantities that in a short time will be as reliable a measure of the causes of disease as the facts of the Registrar-General are of the causes of death. It contains medical and surgical eye specialists, medical and surgical ear specialists, medical skin specialists, medical specialists in the psychology of feeble-mindedness, specialists in tuberculosis, specialists in the other infections. It contains, too, nurses, health visitors, students of infant life, sociologists.

The latest specialism to demand medical superintendence is physical education, with its wide range of preventive disciplines and its elaborate system of remedial gymnastics. The College of Hygiene at Dunfermline, where we meet this afternoon, is essentially a medical college, with a medical principal and a medical staff, assisted by men and women skilled in manipulative methods of training and treatment.

Every school medical officer ought to have some knowledge of every one of those specialisms. His specialism is the concentration of them all on the many-sided problem of the school child. This is a branch of the higher clinical medicine. It is the application of sound physiological ideas to the maintenance of the highest physiological normal. That is what we mean by preventive medicine.

But there is one thing to remember. The purpose of all these co-ordinated medical specialisms is not itself a medical purpose. The purpose is to aid in the producing of as high

a type of human being as the inherited capacity of the individual entitles him to be. And when I say human being, I mean a human being in the full sense of the term, a self-conscious personality, acting and re-acting in the rich and varied world of civilised life. Nothing less governs our whole system of medical inspection; nothing more is needed to keep our energies constantly directed towards the training of good citizens.

When the first rough work of dealing with gross disease settles into its due proportion, there will be time for work more subtle and delicate. There are the problems of the time-table, the right number of hours for work, for play, for sleep; the nature of good dieting and feeding; intellectual fatigue; economy of mental strain; the application of the tests of mental fitness revealed by experimental psychology. As time goes on, each of those great divisions will claim attention, and in each the skilled medical observer will play his part. When, therefore, I hear of the monotony of examining hundreds of children, I turn my mind to some of those unending ramifications of educational psychology, and I ask myself how can that be monotonous which through every hour of the day, with endless variety, presents for our study problems in every science, in physics, in biology, in chemistry, in physiology, in sociology, in ethics? From each of these and from many other standpoints the child can be approached. He is the focus of all the activities that constitute the art of life.

To all this there is the popular objection that we are keeping alive the unfit at the expense of the fit. This is really a kind of broken-winded Darwinism. I decline to believe that you are doing harm to the child, or to the parent, or to the race, or to the society of the moment, or to the society of the future, if you take means to secure that every child shall come to school clean, sufficiently fed; that he shall have his vision corrected if it is defective; that he shall have his ears treated if he cannot hear properly; that he shall have his skin treated if he has skin disease; that he shall have his heart, his lungs, his bones, his joints

examined before he is required to undergo physical education; that he shall have his teeth treated when they are bad; that he shall have his hours of work adapted to his particular capacity; that he shall have sufficient play to preserve his elasticity and to promote his growth; that, in a word, his individual nurture shall be so superintended that he shall achieve the maximum of his individual fitness at every stage of his growth. The methods of carrying out these examinations and prescriptions are, indeed, various; some of them may be good, some of them may be bad; but I have yet to see any social mechanism, theoretical or actual, that will please everybody. If we are to make men out of children, we now know that, in the infinitely complex conditions of modern life, we cannot do so by letting the children take care of themselves. The reports you have already prepared on the half-million children you have examined are alone a sufficient proof of that. Good agriculture does not consist in letting the weeds fight it out among themselves and trusting to natural selection to secure a "fittest"; it consists in providing conditions that will give every good seed a chance to show what it is worth. It consists, further, in first discovering what the standard of fitness is to be, and then establishing the conditions that will on the average secure it. I cannot see why the cultivation of food crops should have a stronger claim to scientific treatment than the cultivation of the children that are to consume them. If vermin attack the plant, you take means of killing off the vermin without destroying the plant. But if vermin attack children, you are to leave them to fight it out. If a fungus attack the potatoes, you turn on the fungologist to extirpate the fungus; but if the fungus of tuberculosis or measles attack the child, you are interfering with the survival of the "fittest" if you side with the child and go against the bacillus!

But, meanwhile, there are certain problems lying to our hand. Of these, our programme gives some indication. At this the first conference—the first, let us hope, of a long series—it is impossible to discuss everything; but an effort

has been made to concentrate attention on two or three urgent and practical questions.

At the beginning comes, naturally, the hygiene of the school, which forms the groundwork of all study of the school child. Next there is medical research, and to none of those familiar with the examination of school children is it necessary to suggest how numerous are the conditions demanding investigation. But, as good physical education is the climax of sound personal hygiene, we propose to discuss the organisation of physical education as a part of medical work. Fortunately, through the kindness of the Dunfermline Carnegie Trust, we shall have the enormous advantage of studying the lines of work followed by the College of Hygiene, which is the only central institution for physical training in Scotland. How rich in possibilities the work of the Dunfermline College is only those can know whose duties bring them into intimate relation with that organisation. The aims of the Physical Training Commission are there being honoured by the evolution of methods that fit the educational genius of Scotland; for it is now consciously realised that physical education is a mental process, and, to attain its best results, it must form a part of a carefully-designed educational curriculum. But the special teachers of physical training do not stand alone. They form part of the great phalanx of teachers that carry on the general work of the schools. And those teachers themselves have, for the last eight or nine years, been receiving, also at the hands of medical men, systematic instruction in school and personal hygiene. At each of the great training centres—Edinburgh, Glasgow, Aberdeen, and Dundee—those courses of instruction have been actively developed, and every teacher in training is taught how to observe children and how to maintain the hygiene of the school. When, therefore, the medical inspector enters a school he finds there to welcome him a teacher whose mind is already informed, and whose sympathies are already enlisted in the whole scheme of medical inspection. Nor are the school teachers themselves neglected; for we propose to discuss,

from several points of view, the medical examination of candidates for the teaching profession. It is perhaps too little realised that the constant strain of detailed attention necessary to the good teacher tends itself to break down even the strongest nervous system. There is no profession that demands greater care in securing that healthy men and women shall be selected. Ever since the training of teachers began, the medical officer has had an important function in the process of selection; but to-day his function is more important than ever. All candidates for the teaching profession, from the time they enter as junior students to the time they go out as trained teachers, have the advantage of constant medical superintendence. This is why so important a place has been given to the medical examination of teachers. It is universally recognised that teaching is a profoundly difficult profession; that the medical inspection of children depends for its success largely on the knowledge and the sympathy of the teachers, and that if the nine school years of the elementary school child's life are to fit him for the higher branches of education, or for the more complex duties of social life, the teacher as well as the child must be kept on the higher plane of good health. This discussion will be opened by men that have had several years of experience in the medical examination and superintendence of teachers in training.

Then comes the last of our discussions—medical treatment of the children in town and country.

These discussions ought to give full opportunity for the exchange of practical ideas bearing on the school life of child and teacher. It is, however, worth indicating somewhat more specifically the further problems that have emerged from the administrative activities of the education authorities. If there is one conception that now dominates the practice of education it is that educational institutions must be more intimately adapted to the physical and mental conditions of the children to be educated. There is, for example, the problem of the nursery school. If you read Miss Hardy's "Diary of a Free Kindergarten" you will

find admirable illustrations of what personal enthusiasm can do to prepare the infants of three and four for the days when they will become the official pupils in the public schools. In Scotland the nursery school is slowly coming to its place in the social organisation. But it has already justified itself. The great ideas of Pestalozzi and Froebel have for a century excited the liveliest interest in this country as in others; but those ideas are not to be taken as final. They have their sequel in the brilliant studies and practice of Dr. Montessori of Rome. It is said of a certain philosopher that he invited mothers to bring him their children at an early stage in order that he might educate them. A mother brought him an infant one year old. The philosopher received her kindly, but said—"I am afraid it is already too late." This extreme view we may, perhaps, safely leave to the philosopher; but unquestionably the care and education of the child through the period from one to five is amongst the most important of parental and scholastic duties. Doubtless, in the multitudes of examinations made by medical inspectors it has more than once been felt that the child of five has already suffered from the conditions of his nurture. How far the work of the medical inspector can be expected to include infancy is itself a question that future conferences may well discuss. But the conditions of the nursery school deserve, and will receive, the most careful study, not least from the medical man. Madame Montessori is herself a doctor of medicine, and it is in the spirit of our movement that she, a medical woman, should have given a new impulse to the study both of abnormal and of normal infants.

Then, there is the "Recuperative Residence School." This also is rather young in Scotland, but it has already appeared. On the Continent of Europe it is an old institution, for the school doctors soon discovered that the children "below par" needed the rest and stimulus of the special school in the forest to re-fit them for the work of education.

Out of this grew the "Open-air School," and its type is, of course, the forest schools of Charlottenburg, instituted

and organised by Dr. and Madame Neufert. Thousands of people have visited those schools, and their imitations are springing up all over the world. They have already begun in Scotland and England, and are eminently calculated to secure the continuity of education without sacrificing the health of the child.

The special schools for physically or mentally defective need only to be mentioned. They are well known.

But the system of medical inspection, as the memorandum of the Scotch Education Department indicated in 1909, covers a much wider field, which, however, is as yet largely unexplored. In the secondary and higher grade schools there arises the problem of how best to guide the adolescent boy and girl from the plane of relative childhood to the higher plane of manhood and womanhood. There is not an educational congress or conference in the world that has not discussed the difficulties and dangers in the education of adolescence. It is a period that demands infinite care and delicacy. It demands, too, the best medical science and the best skill. It is the time of great departures. It would alone fill the two days of our conference and yet leave a multitude of things unsaid. It is here that questions of over-pressure become a serious reality. It is here, too, that the preparation of the boy or girl for the serious work of life demands all the wisdom of the best social insight. It is admitted on all hands that, in the society of to-day, whether we think of it as it is in the school or in the workshop, there is no more pressing or more difficult problem than the training of the adolescent. Detail is not needed here; for doctors and teachers and parents are only too familiar with the difficulties.

The special tuberculosis school is another problem for discussion. It is a necessary part of the anti-tuberculosis campaign, and school authorities everywhere are recognising the fact. 6

There is, further, the question of the medical supervision of the continuation schools. Here we are face to face with yet another difficulty—how far can we, without danger to

the boy or girl, require the industrial worker to continue at school? Is it medically right to permit a boy or girl to work eight or nine hours a day and then require two or three hours of intellectual labour at an evening school? It is here that all the problems summed up under the word "fatigue" clamour for scientific investigation. That the training of the continuation school is necessary to industrial efficiency no one now seriously disputes; but the conditions of the training are certainly a matter for medical consideration.

These are some hints of what lies in the immediate future. All over the world these specialised schools are developing. They are proving their claim to a place in our industrial organisation. They are acknowledged to be outgrowths of immense value in our educational systems. They may even be regarded as primary conditions of national efficiency. And, did time allow, we might elaborate still further. But, perhaps, the most immediately pressing of all is the organisation of the treatment of the ailments and defects already known to exist among the children examined. The reports of the medical inspectors in England and Scotland have now taught us how vast in number those ailments and defects really are. Already the Scotch Education Department has placed at the disposal of the school authorities a large sum for the treatment of children in hospital, in special schools, in school clinics, and in other institutions. But, already, to some extent the school authorities have themselves prepared the way. Among all our discussions none will be more interesting than the last—How best to organise treatment in town and county. The experiments already made are a guide to the developments now everywhere recognised to be desirable and necessary. It is now clearly seen that if the full-grown man or woman is to pass into the duties of life with reasonable health he or she must have medical direction during adolescence. And if the boy or girl is to pass safely into adolescence he or she must have medical direction in the elementary school age. And if the infant is to pass healthily into the stage of boyhood or girlhood it must have

the medical direction appropriate to early childhood. And so, with perfect continuity from birth to manhood and womanhood, the need for scientific nurture is coming to be more and more appreciated. Perhaps, after all, the philosopher was right; in some cases irreparable damage is done even in the first year of life. The medical inspector in the work of his every day has to look backwards to infancy and forwards into adolescence, so bridging the long interval between infancy and maturity. And if, from day to day, he keeps steadily in his vision the flowing growth of personality from the dawn of intelligence to the maturity of character, he will put a new value on the endless detail of his duties, and he will find in the eyes of the children an inspiration that will leave him "unwearied in that service."

If this is our outlook and these are our problems, nothing more is needed to prove how catholic the mental equipment of the school doctor must be and how great the part is that he must play in social growth.

III.

THE HYGIENE OF THE SCHOOL.

By A. CAMPBELL MUNRO, M.B., D.Sc., Advisory School Medical Officer and Medical Officer of Health, Renfrewshire.*

THE subject of our discussion this morning may appear trite and time-worn. Undoubtedly a great deal has been said and written as to the hygiene of the school, but, if I may say so without presumption, a great deal of it has been mere repetition. I believe the time has come when the whole question may with advantage be considered afresh and an effort made to arrive at definite conclusions for future guidance.

The starting-point in any such discussion must be the design and construction of the public elementary school. Indeed, I am afraid that, if we are to deal sufficiently with this matter to-day, there will be little time left for dealing with more general considerations.

I have thought that it might be convenient in the discussion to have before us a definite text—in the shape of a plan of a possible set of school buildings. I have had such a plan prepared, and I hope that it may serve the purpose of guiding the discussion along definite lines.

I should like to say at the outset that I am deeply impressed with the necessity of having the matter of economy constantly before our eyes in the designing of schools. Economy is not a popular doctrine in these days. I remember the time when "Retrenchment" was one of the battle cries of a great party. That time has passed—I hope not beyond recall. Unheeded expenditure has led to a serious

burden of rates. Mr. Sidney Webb regards the general increase in rates with a light heart, desires, indeed, to see it widely extended. But the burden of life is becoming harder on the poorer classes, and the rates add materially to that burden. Rents have risen, and bear hardly on the labouring classes. I was interested in an analysis of the items which go to make up "rent" which an architect gave me the other day. He told me that in a town, on an average, every shilling of rent might be regarded as made up as follows:—For the building, 7d.; for ground, 1d.; for rates and taxes, 4d. I admit that the ratepayers get a good deal in return for the rates they pay, but I do not think they get value for their money. I confess, in particular, that I do not think they get value for the school rates they pay. That is borne in upon me when I recall one school in a comparatively small industrial town which cost the ratepayers no less a sum than £20,000, or a village school which cost £9000. I protest against the palatial school buildings, monumental piles, which are being erected all over the country, of a construction calculated to last to the day of doom, which will have become antiquated before they are old. I desire that the children shall have everything that makes for health and educational efficiency, but I would save the money required to meet these ends by limiting the expenditure on what I may call architecture.

I submit, therefore, that elementary school buildings should be plain and simple in appearance, built possibly of brick, rough-cast, without any superfluous cubic contents of walling, without any adventitious ornament, but with, perhaps, a red tile roof to give a bright effect to the whole.

In another respect I would propose to effect an economy. Instead of a monumental pile, set high for architectural effect, although nominally for healthfulness, the school buildings I project would have their floor level only about 6 inches above the natural level of the site. The building would be set upon a layer of concrete, upon which, in the occupied apartments, there would be superimposed a layer of breeze asphalt. The boards would be nailed to the asphalt. We

should thus have a practically noiseless floor, and would save a considerable amount of money which would otherwise have been sunk in useless underbuilding.

The economy which would be effected in these ways, and in other ways which I shall subsequently refer to, would leave us something in hand towards the expenditure on the treatment of defects in school children, which is an infinitely more important matter than architecture.

Now as to the design of the school. We are under a debt of gratitude to Dr. Reid, the county medical officer of Staffordshire, for bringing a fresh mind to the consideration of this question. The central hall type of school had come to be the accepted thing. No architect who entered a competition for the design of a school had a chance of success unless his design included a central hall. The central hall design had definite advantages. It was compact; it was convenient; it was assumed that it facilitated the supervision of the classes by the headmaster. But I think it is inadmissible in consideration of the obstruction it offers to the ventilation of the school. The noise of drill and athletic exercises interferes with the work of the classrooms, and the central hall maintains a dusty atmosphere at the entrances to the classrooms.

The efficient ventilation of schools is important, not merely on hygienic grounds, but from the educational point of view. It has been found, surprisingly enough, that, under good atmospheric conditions, the work done by the scholars at the end of two or three hours compares favourably with that done at the beginning of the period. Under adverse atmospheric conditions the work deteriorates definitely towards the end of the period, more especially in the matter of accuracy.

Instead of the central hall type of school, Dr. Reid induced the educational authorities in Staffordshire to adopt what is termed the pavilion type, which provides for the cross-ventilation of every classroom.

Dr. Reid instituted a series of comparative tests of the purity of the air in the classrooms of the different type of

schools, taking the amount of added carbonic acid as a standard. He found that in the classrooms of the pavilion type of school the impurity figure was very slightly above the standard 2.0 volumes carbonic acid per 10,000. On the other hand, in the central hall schools that figure was exceeded five times. In the classrooms of a plenum-ventilated central hall school the impurity standard was exceeded more than two one-half times.

It is interesting to note, in passing, that under the Staffordshire system of ventilation the air of a room provided with an upcast shaft was no purer than that of one without a shaft.

On general considerations, and taking Dr. Reid's results into account, I hope this conference will homologate the view that no more schools of the central hall type should be built, and that atmospheric impurity should be averted by the aeration of classrooms by cross-ventilation.

How is this to be achieved? I have seen a number of schools in which Dr. Reid's method had been partially adopted, with good results so far as they went.

For cross-ventilation it is, of course, necessary that two opposite walls of a classroom shall be external walls, with windows.

The type of window used in the Staffordshire schools is simple and inexpensive. It is illustrated in a corner of the plan which has been placed in your hands. The window is an ordinary sash window, with cords with handles, by means of which the lower sash can be raised or lowered with facility. To this is added a sheet of plate glass, two feet in depth, in a frame fixed on its lower margin to the window sill close to the window rail, and falling back into the room at such an angle that the top margin of the frame is at a distance of 9 inches from the window. The two end angles are filled in so as to preclude a direct draught. In this arrangement the ventilating opening is increased, as desired, by raising the lower sash of the window. The area of the openings in the Staffordshire schools, when the lower sash is raised sufficiently to take full advantage of the hopper openings, taken with certain

radiator openings, and the opening represented by the space which separates the upper from the lower sash, works out at about 45 square inches per child, or ten times that required by the Board of Education.

I confess that for a long time I was of opinion that the only satisfactory method of ventilating schools was that known as the plenum system. I was charmed by the purity of the atmosphere attainable under that system. As the result of a systematic test by the aid of a smoke-producing machine, I had satisfied myself that the diffusion of the pure air introduced was uniform throughout the school. I am still satisfied that, for theatres and crowded assemblages, it is impossible to ventilate the building efficiently by any other method. Nay, more, I am satisfied that, while the staff of plenum-ventilated hospitals, clad largely in out-of-door garments, and moving actively about, have complained of undue heat, the patients, frequently with feeble circulations, and lying absolutely still, are not inclined to quarrel with the temperature. Notwithstanding all this, I have come to the conclusion that such a system of ventilation as that which I may term the Staffordshire is the best for schools. The defect of the plenum system is that it warms by warming the air, not by radiant heat, and is thus physically less satisfying; and it does seem as if the heated air had lost some stimulating quality of freshness. If a practicable system of heating schools by steam-heated pipes and radiators could be devised, it would be greatly superior to the system of heating by low-pressure hot-water pipes (as in the Staffordshire schools), as a much greater proportion of the heat produced would be radiant heat, a much less proportion conducted heat.

The plan before you is drawn to scale, although the scale is not shown upon it. You may, however, have observed that the floor area is slightly greater than that generally shown. This increase in floor area is obtained without any increased expense. It is obtained by cutting off, so to speak, the top foot cubic space and bringing it down among the children. It is curious how the desire for "lofty rooms"

persists. People speak of "lofty, airy" rooms. But I myself sit in a church where there is a very high roof, but which is the reverse of "airy"—there is, as a matter of fact, practically no ventilation. The Education Department is very moderate in its demands as to the height of ceilings, requiring only 13 feet, 14 feet, and 15 feet, according to the size of classroom. But I suggest a standard of only 12 feet in any size of classroom. The top foot of air space is of very little use to the children below—under the 5-foot level—while it would be of very considerable use if distributed over the lower strata where the children live; and there is plenty of space in the 7 feet above the children's heads for the diffusion of the cold fresh air entering by the windows. Of course, with a lowered ceiling there will also be less strain on the teacher's voice. Deficient acoustics are largely a matter of too lofty ceilings.

The question of heating is intimately associated with the question of ventilation. It may be laid down with certainty that the heating apparatus should be sufficient to maintain the temperature of the classroom at from 56 degs. to 60 degs. If the temperature falls below 56 degs., the educational capacity of the child is reduced. Part of the bodily energy which should be devoted to brainwork is diverted into maintaining the temperature of the body. Further, when the temperature of the classroom falls below that which is comfortable, there will be an irresistible tendency to reduce the area of the inlets.

I fancy it is generally recognised nowadays that open fires are quite insufficient to maintain a proper temperature in classrooms. The class teacher may consider it all right, but, then, she is standing within a few feet of the fire, and is moving about. I should like in such cases to have the verdict of the back benches.

To compensate for the free ventilation attainable by the above system, Dr. Reid warns us that the mean heating surface, on a low-pressure hot-water system, should be 19 square feet per 1000 cubic feet of surface. The hot-water pipes are kept out from the wall and well raised above the

floor level, and should blossom forth into radiators placed in at least one window recess on each side of the classroom, opposite the children's seating accommodation. It should never be forgotten that, however liberal the heating surface, in cold weather the air of the classroom, in circulating, comes into contact with the cold window surface, and descends in a douche of cold air upon the children sitting near the window. In the wall of the window recess in which the radiator is placed there should be a large inlet grating of about 200 square inches in area. The flesh is weak, and, even if the rule be laid down that the windows are never to be entirely closed, it is well that there should be an inlet area which is uncloseable.

It should be laid down in the school rules that (1) the windows are to be as freely open as the weather permits, and are never to be entirely closed, and (2) during play intervals the windows on both sides of the classroom are to be kept freely open for at least five minutes, and also for a quarter of an hour or more following the morning and afternoon attendances. I suggest that it should be the duty of the school medical officer, in visiting a school, to note specifically in what degree these requirements are fulfilled.

The question of lighting must be considered. It is axiomatic that the light should fall from the left. Some architects appear to be able to arrange this in every classroom in a school. Others, when one is criticising on a plan the defective lighting of some of the classrooms, inquire—well, how could you provide correct lighting in these? The fact in such cases generally is that the matter cannot be corrected without entirely altering the design of the school, which the architect is very reluctant to do.

In the plan which has been placed before you, you will observe that the lighting is correct in every instance. In fact, the design of the school is entirely subservient to ventilation and lighting. You will also observe that the windows providing the main light have a southern exposure. In our dull climate, especially in winter, the better lighting of rooms with a southern exposure—even when there is not a glimmer

of sunshine—is most noticeable. I think a good deal should be sacrificed in order to obtain such an exposure. You will observe that the annexes—cloakrooms, &c.—are placed in rear of the main building so as not unduly to extend the length of the building, or unduly occupy the sunny exposure.

Perhaps it may be convenient that I should at this point direct your attention to one point which is usually neglected by the school architect, that is, the necessity for making provision at the first for the easy and economical extension of the school. I have many times seen an extravagant expenditure of money incurred in pulling a school to pieces in order to make provision for an extension of the school. The plan before you shows in solid lines a village school with provision for about 300 children. Suppose it is found necessary to extend the school, an extension to accommodate about 100 more children can be obtained at one end, as shown in outline, involving only the pulling down of a screen at one end of the verandah. A later addition of places for another 100 children can be obtained, similarly, at the other end of the building. Suppose that at the outset it is a question of the erection of a school in a considerable town for, say, 1000 children, the design before you still holds good. Upon the ground floor of the extended school shown on the plan there would be superimposed a similar upper floor, with stairs of access in rear—or between the portion shown as permanent and that indicated as an “extension”—at each end.

Next in importance to the matters I have referred to is the cloakroom accommodation. A cloakroom is provided for each pair of classrooms, on the way out, so to speak. These cloakrooms would be liberally heated and ventilated, care being taken that the incoming air is heated.

A matter which by reason of its importance might have come earlier is that of the provision of baths. I should like to have the opinion of the conference on the question whether the provision of spray baths (with, of course, both hot and cold water laid on) should not be insisted on in the case

of every school built from this time forward. I have great faith in the physical and moral efficacy of baths. I feel sure that once a child has enjoyed the sensation of feeling thoroughly clean it will never again feel comfortable when thoroughly dirty. A clean child will be a self-respecting child. But the bathing process must be made reasonably comfortable. The bathroom should have a pleasant temperature of about 62 degs. in all weathers. To facilitate that I have, in the design before you, placed the bathroom over the heating chamber.

A feature of the design before you is the verandah arrangement. The verandahs would have wired-glass roofs. The passages from classroom to classroom—to the baths, to the drill and play hall—are under cover. They would serve as shelters in the intervals in bad weather.

Another point in the plan is that the latrines are brought up so near the school as to be well within the supervision of the teachers. This is, as I regard it, a matter of some importance.

The only remaining feature of the plan to which I need refer is the drill and play hall. This is so placed as neither to interfere with the ventilation or lighting of the classroom, nor by reason of noises in it to interfere with the teaching in these rooms, while at the same time it is easily accessible by covered ways. This, according to my view, would be a building of economical construction; indeed, of wood and iron. I would make so much of a concession to æsthetic considerations as to make the external walls of what is known as "expanded iron" plastered with cement and roughcast. Such a building would cost about half as much as that ordinarily provided, and would be equally efficient.

I shall not detain you by labouring obvious things, as that all internal corners should be rounded, that there should be no ledges for the retention of dust, that there should be no shiny blackboards, and that there should be no slates, or as to the importance of the systematic cleansing of the schools.

Summarily, the points I desire to place before you are—(1)

That there is room for considerable economy in the cost of the construction of schools, without loss of efficiency. (2) That no more schools of the central hall type should be built. (3) That the Staffordshire type of classroom and system of ventilation is the best. (4) That in the Staffordshire type of school adequate means of heating must be provided. (5) That classrooms should be, and can always be, lit from the left. (6) That in the first design of any school for the reception of under 1000 children provision should be made for its economical extension. (7) That cloakrooms should be thoroughly ventilated by heated air introduced at or near the floor level. (8) That spray baths, in a comfortably warmed apartment, should be provided in connection with all new schools. (9) That the latrines should be placed so near the main buildings as to be easily supervised. (10) That the drill and play hall should be of an inexpensive type of construction.

Mr. Chairman, ladies and gentlemen, I have placed the plan before you in the nature of a kind of target at which you may aim your criticism. One that I anticipate is that a very large frontage is required. I think that would be obvable if School Boards would only look sufficiently far ahead.

DISCUSSION.

Dr. G. Dick (County of Caithness) asked Dr. Munro's opinion as to the relative value of the different systems of ventilation in small country schools. He pointed out that systems other than window ventilation had been tried in those schools and proved more or less a failure. Agreed with Dr. Munro's suggestion.

Dr. Walter F. Brown (Ayr burgh) said—I have to thank Dr. Munro for a most valuable and instructive paper, one pregnant with matter calling for discussion. The first practical point to which I would like to draw the attention of the Congress is our position as school medical officers when new

schools are proposed. Are we at present to wait until the schools are completed before we interfere, or are we to demand that plans of proposed schools be submitted to us for approval? I am of opinion that, in order to avoid friction with our respective authorities, an order be issued by the Department that all plans of proposed new schools and alterations to existing schools must be submitted to the school medical officer for his opinion, and report on the hygienic aspects of the plans. I am at one with Dr. Munro in his criticism of the plenum system of ventilation, and his advocacy of the natural system. The plenum system is not only costly but is unsatisfactory. I am of opinion from a considerable experience that the natural system is the most satisfactory, and that there is no real difficulty in carrying it out when an intelligent interest is taken by the teacher in the matter.

Dr. Ernest T. Roberts (Glasgow School Board) said the pavilion type of a school is undoubtedly satisfactory, but does it not involve a greater expenditure on sites than is justifiable in large cities, and in some cases the larger site is not possible? Extraction method of ventilation is good, deserves greater consideration where mechanical means are necessary, and is certainly better than the plenum system. Spray baths have been instituted in several of our large schools in Glasgow, and in some a vermin destructor has been added for sterilisation of the clothes. The results have been always found to be beneficial.

Dr. J. Hally Meikle (Edinburgh School Board) said one of the chief difficulties in connection with school buildings in town is that many of the old schools do not come up to our modern ideas, and that alterations are often difficult on account of the street and the position of the school. Another difficulty is that of securing sufficient open space for new schools. The central hall type of school is now being departed from in Edinburgh, and schools of the verandah type are being introduced. The open-air type of school is also being introduced. This con-

sists in having one side of the classroom of a movable nature. It is in use chiefly in connection with special schools, but it can be adapted to ordinary schools when the site as regards exposure to quietness is suitable.

Dr. Alistair Mackenzie (Carnegie Dunfermline Trust)—Can Dr. Munro give any idea of cost per cubic foot of building, total cost for 300 children, total site and playground area required, exact scale of the plan?

Dr. A. Gilmour (Paisley burgh) said that senior, higher grade, and supplementary departments of schools in town areas should be removed to the outskirts of the town, thus leaving the present central areas to be altered for infant and junior departments on the lines suggested by Dr. Campbell Munro. The increased accommodation would be obtained at smaller cost for sites, &c., the walk to school would benefit the older scholars, and infectious diseases would be under greater control.

Dr. Robert Bruce (Glasgow School Board) said Dr. Campbell Munro's plan shows a combined room for headmaster and medical inspector. Would it not be better to keep these apart, both for the headmaster's comfort and the comfort of the medical inspector?

Dr. William Bruce (counties of Ross and Cromarty) said the ideal system of ventilation was by windows on Dr. Campbell Munro's plan combined with the old-fashioned plan of open fires.

Dr. Murray (counties of Ross and Cromarty) asked Dr. Campbell Munro if he had any experience of a system of heating classrooms with open fireplaces and hot-water pipes combined. His experience was that in rooms heated with hot water the children were listless and not so alert in the afternoon as in rooms with open fireplaces. He (Dr. Murray) thought they could not efficiently heat classrooms with open fireplaces alone; but he thought that a combined system of pipes and fireplaces would be the ideal system, at anyrate for the smaller schools.

Dr. Campbell Munro, in reply, said that he quite recognised the reality of the difficulty referred to by Dr. Roberts,

namely, the high cost of land in towns as an obstacle to the erection of schools of the pavilion type. He suggested that some economy in the purchase of land might be effected if School Boards would look well ahead and secure cheap sites for future use. Then the economy of the type of construction suggested would go a long way to meet the enhanced cost of the site. Dr. Munro's experience of the ventilation of schools by the extraction method had been unfavourable. There was apt to be over-ventilation in the vicinity of the extracting outlets, while corners and dead ends were left practically unventilated; and, unless the windows were kept well open—when there would be a short circuit between the windows and the outlets—air was liable to be drawn in from undesirable sources.

In reply to Dr. Mackenzie, Dr. Munro said that the scale of the plan was one-eighth of an inch to the foot.

The mean cost per school place in the case of three pavilion schools built was £10 10s. 4d., as compared with £15, the mean cost of the central hall schools previously built.

IV.

A PLEA FOR SCHOOL MEDICAL RESEARCH.

By **GEORGE ROSE, M.B., C.M., D.P.H.,** Chief School Medical Officer, Aberdeen.

ALTHOUGH the subject of medical research in schools requires no apology in a meeting of school medical officers, a few words on its need and utility may not be without benefit to educational authorities and the general public, to whom information regarding the proceedings of our conference will sooner or later filter out. Many of these may think unconsciously that the whole time and energy of school medical officers should be devoted to ascertaining and remedying defects from which the children suffer during school life, and which handicap them in after years. I grant that their thinking has something to say for itself. The amount to be done for school children is great, and the need is urgent. Filth has to be eradicated, the many and increasing defects of the special senses have to be remedied, the ailing to be nursed back to health, the starved fed, the naked clothed, and the narrow chest, the weak spine and muscles strengthened and developed by appropriate physical exercises. The work taxes the time and energy of all engaged in it, and, were medical research to be of no practical benefit to the children, I would not appear as an apologist on its behalf. But it is because I believe that research investigation made in our school work will be productive of good both to school medical officers and to pupils that I consider it desirable and practicable. Now that every child in the kingdom is being weighed and measured and medically examined to a greater or less extent at least two or three

times during its nine years of school life, and the result of those measurements and examinations tabulated, it must be apparent that a vast mass of information is now being collected regarding the physical and mental condition of the juvenile population which has never before been available. The facts regarding the physical and mental health of the children are now known; but while the individual examination should be primarily for the good of the individual, there are generalisations to be made from the accumulated facts that should ultimately be of benefit both to the individual and to the community could they only be collected and utilised for this purpose.

Apart from the above good to the individual and to the community, there is the interest of such work to ourselves as school medical officers. No one engaged in school medical inspection can deny that the work is monotonous; indeed, I know of no work more fatiguing, and that suffers more from lack of variety, than that of the assistant school medical officer, who, day by day and week by week, covers practically the same ground, and is in his examination—especially of the heart and lungs—continually seeking for conditions seldom found, and who, when confronted with a morbid condition, finds it often so vague and indefinite that he may be inclined to attach little value to its discovery. No wonder that interest gets blunted and the mind tired, yet, if the work is to be efficiently done, attention must not flag, and if the mind is to be kept tense some particular work of investigation in the daily routine will prove not the worst tonic for the purpose.

And if any spur be needed to urge us to take up research work, a consideration of what has been done in other fields will supply the stimulus. Clinicians and pathologists vie with each other in the study of the manifestations of disease. Obscure diseases are investigated, new signs and symptoms observed and named, and our knowledge of the causation and sometimes of the cure of disease extended. The study of medicine in the past has been intensive; we may make our investigations extensive. From the nature of our work and

the lack of time and opportunity, a minute study of disease is impossible to the school medical officer. Some of the systems of the body are practically "closed country" to us, and, interesting though they may be, their investigation must be left to others. There is, however, a wide though limited field of research open to us which none but we may step in and occupy.

There is no excuse for slackness on our part in so doing. Voluntary workers are occupying the field. At present there is an investigation being undertaken by voluntary workers all over the world regarding the incidence of oœna among school children, an inquiry that could be answered quickly and with little trouble by the school medical officers. And some workers single-handed have reaped a rich harvest. The original and stupendous work of Mr. Tocher, of Peterhead, in charting the colour of the eyes and of the hair of school children in all parts of the kingdom is monumental in its character, and shows how much may be done by the efforts of a single individual. It would be a standing disgrace to us if with our opportunities we did not try to reap in a similar field. Let me endeavour to indicate briefly some subjects for investigation, and how the work may be taken up.

PRELIMINARY WORK.

As a preliminary, there is need for an accurate definition of the terms and meanings we employ in the work of medical inspection. True, most medical officers have made an attempt to define the terms, but the definitions and the meanings vary almost as much as do our record cards.

A second necessary preliminary is to have uniformity in our method of measurement. Children of one district who have been weighed without their boots cannot be compared with the children of other districts where boots have added to the weight. It is no great task to remove the footgear, and its removal means a considerable error eliminated. Differences in age, especially in the last year of school life, must be taken into account if comparisons are to be of value.

The average height and weight of a group of girls of thirteen years and two months is not to be compared with those of a group thirteen years and ten months. Allowance must be made for the difference in age. Indeed, the conditions, as far as possible, under which the children are to be weighed and measured should be the same all over, and the conditions may be fixed with very little trouble. Meantime our statistics and comparisons bring us under the sweep of the satire of the eugenicist, who says "we collect statistics inaccurately and use them stupidly." If measurements are to be made of the individual child, surely the work may be done by a method which places their value beyond the cavil of the most finical statistician, and if we have a collection of accurate individual measurements some good use may be made of them, but till accuracy is secured, combined with uniformity, our work and time are being wasted. As the School Medical Officers' Society has undertaken the consideration of these points, a satisfactory result of its deliberations may be looked for in due course.

One of the first and most practical things to be investigated is the colour sense in children. Competent observers have already shown that colour sense is defective in about 4 per cent of those examined in all parts of the world.

The importance of this to a maritime nation like ours is apparent. Our fleets plough every sea, and our fishermen in the pursuit of their calling sweep distant waters, as well as our every shore. The safety of property and of life depends on the correct colour vision of those tens of thousands engaged in maritime pursuits, and, when we add to them others engaged on the railways, it brings a grand total of hundreds of thousands to whom correct colour vision is an imperative possession.

Recently I made inquiry into the number of those resident in Aberdeen whose employment rendered correct colour vision necessary. There were over 4000 engaged in the seafaring trade, and on the railways 1000, a total of 5000. Many boys enter those employments annually, of whom some are unfitted by visual defects from these callings. In the interest

of the boys, and in the interest of the community, an endeavour should be made, not to eliminate the unfit from the service, but to stop them at the portal.

Recently I have been testing the colour vision of boys of thirteen years of age by means of coloured glasses. The method is not satisfactory, as colour vocabulary may be defective and not colour vision. The time required for estimating the colour vision by Holmgreen's skeins is too long, but other methods might be tried. Eddridge-Green method promises better results. I consider it of great consequence that this matter be taken in hand.

But a more purely scientific piece of work, and one that should be undertaken by us, is the investigation of the incidence and etiology of rickets. This disease is found in all parts of the world. It is a disease of infancy, but the effect of its presence in infancy often remains to the latest day of life. Excepting syphilis, there is no disease so multiform in its manifestations, for every tissue and system of the body is affected. One would think that a disease so common, and whose effects are so far-reaching, would have been well studied and its causation and treatment worked out, yet I know of no disease where so much difference of opinion prevails as to causation and treatment as in that of rickets.

Again as to its incidence; in looking over school reports, one cannot fail to be struck with the vast disproportion between the percentages of this disease in one town and the percentages in another. The explanation, of course, lies in the difference of definition and of the manifested results of the disease.

Two years ago my assistant and I made an inquiry as to the incidence and results of rickets in Aberdeen. Children who had been affected were arranged into three groups, according to the severity of the attack; the first group, where the attack had been mild, and the only remaining symptom was beading of the ribs; the second, where, in addition to the beading of the ribs, there was deformity of the ends of the long bones; and the third group, where there was deformity of the shafts of the long bones, producing bow

legs, knock-knee, and marked pigeon chest. The different degrees were marked on the record card. Then the heights and weights of the three groups were taken, and an average obtained. The averages of both height and weight of rickety children were found to be less than the averages for the town children of the same age, and the greater the degree of rickets the less the height and weight. The incidence of the disease was 33 per cent. over all, and, while greatest among the poorer classes of the community, in no class was it absent.

An inquiry into this subject might very promptly be taken up by the school medical officers of Scotland, and an accurate knowledge of the incidence and consequences of the disease in the various parts of the country might be obtained. It would be quite easy to compare the incidence of the disease in one part with another. Having obtained this, inquiry might next be made regarding the food used in the place (food being, I believe, the main cause), as well as the other conditions alleged to be factors in its causation. Both on account of the widespread nature of the disease and its serious effects on the health and well-being of the children all over the country, anything tending to elucidate the cause and eradicate the complaint is worthy of our best attention. Indeed, I hold that, as this disease is due to feeding, its commonness is an index of the serious mismanagement of children in the early months of their lives, and is thus the chief factor in the physical deterioration of children in our larger towns.

MENTAL DEFICIENCY.

Although there has been some inquiry into the cause of mental deficiency, the field for investigation is still a rich one. Eugenists and others are at variance as to the causes at work. Some months ago, in the columns of the *British Medical Journal*, two prominent scientists engaged in a gladiatorial combat which showed fully more fighting temper than scientific ability. The method in which the controversy was carried on gave sport to the children of Belial, but did not increase knowledge. Many conclusions on this subject

seem to be due more to preconceived notions than to ascertained facts. While the eugenist may claim his conclusions to be mathematical certainties, it should be remembered that the mathematical machine turns out perfect results only when the material put into it is perfect. Now, were the physical condition and family history of, say, fifty pupils in the mentally defective schools of each of our large towns compared with the physical conditions and family history of fifty normal children picked out at random, something reliable might be obtained for our mathematicians and eugenists. It is worth trying, and would be an interesting piece of work to some of our assistants who have a special knowledge of mental diseases, and with tact in making inquiries at the parents or relatives regarding the family history. Indeed, might I suggest to our assistants that both of these subjects might be properly undertaken by them. I have no wish to encroach on their Saturdays or to discourage their laudable efforts to reduce their handicap in golf, but an hour on a Saturday morning to work up these subjects would not encroach unduly on their holiday, and it would add immensely to the interest of their work.

Another subject worthy of investigation by us is the infectivity of alopecia areata. The disease is common, is easily recognised, and till recently was considered to be of nervous origin and non-infective. More recent views regard it as communicable and infective in its nature. Bacteriology has not yet demonstrated the nature of the infection, yet epidemics of the disease which point to its contagiousness have almost certainly occurred in schools. Dermatologists hedge on the subject. The view often expressed is that it is mildly infectious, but that close and repeated contact is necessary to produce transference of the complaint, such as children sleeping together, or a frequent interchange of headgear. This view would be of more value were it according to ascertained facts. Most cases arise where, so far as is seen, there has been no close contact with an infected subject, and generally, though not invariably, only one member of a family is attacked by the disease.

In any investigation note might be made of its appearance in a school, other members of the class examined, and strict watch kept for any fresh cases. Note might be taken as to whether it appears most frequently in some schools than in others.

Apart from the scientific interest of its infectivity there is the practical question of how to deal with cases of the trouble. May they be allowed to attend school, or should they be excluded? Two considerations have guided me in this matter. First, so long as parents have no option but to send their children to school, the parents have a right to demand that everything be done to preserve their children from all kinds of infection, and my feeling is, better sacrifice the doubtful than risk the clean. Second, when children suffering from the disease are allowed to attend school there is almost invariably apathy displayed in attempting a cure. Where the disease has gone on for months in a child attending school, after exclusion more energy is displayed in attempting a cure, which is usually effected in a few weeks' time.

EFFECT OF REMEDIAL PHYSICAL EXERCISES.

That there is urgent need for more time and attention being devoted to physical culture will be heartily admitted by those present. Judging from the signs of the times, physical culture is in the air, and may be on us in a deluge. We hear and believe of its good effects, but few would be able to give figures in support of their belief. Educational authorities are stiff to move in this matter. Teachers look on physical culture with suspicion and the time spent on it as an interference with the school curriculum. Early in our inspection work I was impressed with the number of children with bad chest development and deficient expansion, and who seemed to me to be more in need of physical exercise than to be taught the geography of South America. It was too dangerous to meddle with physical instruction as a whole, but one's object could be served by

starting remedial physical exercise classes. Two years ago two centres were started in Aberdeen, and now we have five, and soon there will be seven. The Board has willingly granted apparatus and opportunities for carrying out this work. Judging by appearances, the effects of the exercises on the pupils have been most satisfactory. The pupils are more alert, better set up, and seem to be better developed. But accurate information must be obtained of these effects, and during the next session I intend to weigh and measure, and find out the chest girth before the course of those exercises is entered on, and after. For, although impressions may be all right, it is well to have one's views supported by the tape line. The effect of physical exercise on scoliosis or lateral curvature of the spine has to be worked out, and if physical exercises can do anything to arrest the progress of this "despair of the surgeon" they will accomplish a great deal, even although they may not cure. Certainly they will not remove deformity.

Some trifles I have been taking note of are the frequency of molluscum contagiosum in children who attend the swimming baths, the number who had been operated on for appendicitis, and the number of children who have suffered from burns and scalds. The number who have been burned or scalded is appalling, and it represents a vast amount of suffering. Poultice burns are not infrequent. Truly children suffer a deal, and their protests of pain fall on dulled, if not deaf, ears. There is no appeal from the unconscious cruelty of an incapable parent. There is need for us to point out to the public the frequency and danger to children of those injuries, and the need of enforcing the means for their prevention.

THE RESULT OF DIFFERENT METHODS OF TREATMENT OF INJURIES TO THE LONG BONES AND JOINTS IN CHILDREN.

As injuries to the long bones and joints of children are very common, and the methods of treatment differ, school medical officers have ample opportunity of seeing and judg-

ing results. Whether open operation or splints give the best results in treatment of fractures in children is not yet settled, and one who sees the result years after the injury may form a different opinion from the surgeon who treated the case and who saw only the immediate result. Apart from this there is danger of the surgeon being affected with the corvine complacency of thinking his own brood the blackest. This work must be done very judiciously, but some of my surgical friends have invited me to investigate, and wish my criticism.

TUBERCULOSIS.

From its importance this subject might very properly have been given the first place in this paper. I placed it last, for its complexity and magnitude disheartens one. Workers by the thousand occupy the field, facts innumerable are collected, and the accepted conclusions are few. Those of you who have read in the Tuberculosis Number of *The Practitioner*, recently published, the forty odd articles, each by a specialist in his department on this subject, must have been struck with the diametrically opposite views held by those authorities. This is especially so in treatment. Little or nothing seems accepted by the authorities as to treatment. With so many workers in the field, and with our methods of diagnosis so restricted compared with that of other workers, I am at a loss to suggest subjects of research. In addition there are tuberculosis officers and research workers, and they in the sanatoria and dispensaries have better opportunity for the study and investigation of this disease than school medical officers possess. In a case of suspected pulmonary tuberculosis we may not prove or disprove our suspicions by the tuberculin test, nor is it possible for us to use the thermometer night and morning to aid us in our diagnosis; such investigation must be left to others. We may, however, by as careful examinations as is possible for us, continue our investigations on the incidence of tuberculosis. Second, we may keep under observation and re-examine and weigh at frequent intervals

all doubtful cases. Careful note might be made of the improvement in weight and hæmoglobin of children who are sent to open-air schools or holiday or country homes. There is much investigation to be made before the relative value of these places is settled. And as time passes questions will arise to which we desire an answer, and thereby open fresh and proper fields of investigation.

Ladies and gentlemen, I have touched on some of the subjects that seem to me to deserve investigation, and the bulk of which I have been working at myself. The work has given me pleasure and brought profit. Doubtless many present have had their minds occupied with kindred subjects, and an interchange of views may provoke us to further effort in the direction of our common aims.

DISCUSSION.

Dr. J. Clark Bell (Carnegie Dunfermline Trust) said—While we are all agreed that a large number of medical diseases are peculiarly suited for investigation by the school medical officers, we must not overlook those more strictly scientific departments of research. Most of us are convinced of the extent of the field, many deplore the lack of opportunities, but all will agree that so far no piece of medical research work of outstanding importance has been the direct result of medical inspection. Researches other than clinical might profitably run along the following lines:—

(1) The Scholastic Environment.—Such matters as heating, ventilation, and lighting are too seldom the subjects of exact quantitative estimation. Too many medical officers are content to approve of or condemn the heating, lighting, or ventilation without any attempt to state the condition in numerical form. The co-relation of unfavourable environment with fatigue (which can be measured by trustworthy tests) by the newer statistical methods is a work deserving of considerable attention.

(2) Educational Apparatus.—The recent report issued by

the British Association, dealing with school books, suggests a fruitful line of inquiry. The suitability of the books used, in respect of paper, illustrations, size of type for various ages, length of lines, interlinear spacing, &c., could be investigated, and would lead indirectly to a consideration of the psychology of the reading process.

(3) Educational Methods.—The newer methods of experimental psychology may be used to estimate the relative merits of contending methods of instruction. Physical education especially offers an enormous field for research. The general effect of exercise, the effect of particular exercises, the peculiar merits of the Swedish and German systems, the type of exercise most suitable for each phase of growth, and the games giving scope to the activities manifested at the various stages of development, are all researches giving unlimited opportunities for the most scientific.

Dr. Kate Fraser (Govan School Board) said she had investigated the home conditions and family histories of about 100 mentally defective and 100 normal children in Govan parish schools, also Wasserman reaction in 68 mentals, about 30 normals, and members of families about 50. Of 68 mentals 29 gave the results, and in some of the negatives the results were obtained in the members of the families. In only one of the normal cases was a definite result obtained, a child whose mother had had an infection.

Dr. John MacIntyre (Lanarkshire)—The statistics regarding the weighing and measuring of school children are not comparable in the various areas. There is no uniformity of method throughout Scotland. In some areas footgear is removed before height and weight are taken, in other areas an allowance is made and footgear not removed. In estimating the general health of the pupils, school medical officers attach little importance to what the weighing and measuring apparatus records. The routine weighing and measuring of every child examined places a very heavy tax on the time of the school medical staff, and might easily be discontinued except in exceptional cases. To ascertain

what benefit school medical inspection is having on the children of our country, a five-yearly census might be taken of the height, weight, and chest measurement of all school children. A definite standard as regards clothing, foot-gear, &c., could be determined upon either by common consent or by the Scotch Education Department. This would furnish a much more accurate and reliable record than can be obtained at present.

V.

GROWTH OF WORK AT DUNFERMLINE COLLEGE OF HYGIENE AND PHYSICAL TRAINING.

By JOHN ROSS, LL.D., Chairman of Dunfermline Carnegie Trust.

The Chairman, who was warmly applauded, said—On the part of the Carnegie Dunfermline Trustees, I have pleasure in assuring you that they are delighted to meet with you here as their guests. They accept it as an honour that you have selected Dunfermline as a place in which you may obtain suggestions as to the best methods of conducting your work as school medical officers. Dunfermline, through a fortuitous concurrence of circumstances, was led at an early stage to foresee the need for such a body of officers as you are, and was perhaps the first town to provide one such officer for itself. By a process of evolution, which I need not go into in detail, but merely outline, the Carnegie Dunfermline Trustees, after being constituted in 1903, began their interest in physical training by following up a very humble provision for indulgence in gymnastic exercises which had been made by some intelligent public-spirited citizens. They were from this gradually led to extend the work, and ultimately to provide for the teaching of physical culture in all our public schools. We understand that in this matter we fulfilled the duty imposed on us by our Trustees of acting as pioneers. From that they passed to medical inspection of all school children, so securing that the teaching might in each case be adapted to the physical condition of the child; and, further, they were led to the creation of a College of Hygiene and Physical Training, where students,

after pursuing a suitable course of study, became qualified as teachers to communicate what they had gained by their studies to the children in the public schools throughout the country. Further still, medical inspection led on to medical treatment, and here, again, we have the satisfaction of knowing that we have led the way to such treatment becoming general, our example having led to a meagre Government grant to School Boards, but which thus begun unquestionably will lead our rulers on until they grapple with the question of the health and physical development of our school children in a manner commensurate with such important topics. In this connection it became extremely interesting to read in the *Scotsman* that the Secretary for Scotland had introduced an Education Bill, authorising School Boards not merely to recognise medical inspection, but in necessitous cases to provide medical treatment. In outlining what the Trustees have thus been led on to do, it cannot be said that they have as yet obtained any assurance that they have created a perfect system. On the contrary, every step in advance has only shown how much more might be done, and they feel that the task which we have undertaken is always inviting them onwards. The buildings which are now in course of erection will give you an idea of what is anticipated as falling to be done towards furnishing sufficient accommodation for our college, and the clinical treatment of ailing children. Your presence here is a further provocative impulse, because we naturally feel that we are being subjected to examination by competent critics, and you compel us to look to what may need repair or reconstruction in anticipation of your judgments. These onward impulses are what from the beginning we were warned to prepare for. On looking back and reading the addresses delivered on the occasion of the inauguration of our college on 4th October, 1905, it would seem as if some of the speakers had been possessed of the prophetic gift. I refer more especially to the address of that eminent hygienist, Sir John Batty Tuke. He told us that by carrying into effect, as we were doing, the medical

inspection of children, we were bringing into play one of the highest hygienic measures, and were setting an example which would soon be widely followed. That the example has been widely followed is evidenced by the legislation which has since ensued, hastened, as we believe, by our action. Medical inspection of school children has been established by law, resulting in the calling into being of a body of officers, over a hundred in number, engaged in this work throughout Scotland, and it is to us, as you will permit me to say, a great satisfaction that we can look on so large a body of eminent men as are around this table and feel that we occupy a paternal position towards you. We further remember what Sir John Struthers said when he assured us that in establishing the college we had not gone beyond the objects the founder of our Trust had in view, because there could be no doubt that the establishment of the college would enhance the position of our city and make it the centre of an important branch of study, a branch of study which must exercise an influence on education generally. His words have come true. The position of our city has by the existence of the college and the work emanating from it been enhanced to the great advantage of our young people primarily and of the youth of the country generally. We have the satisfaction of knowing that we have dispersed upwards of eighty of our students over the country, carrying out in their several spheres the work which we are doing for Dunfermline. The lady students who have thus gone out are being reduced by what the Department euphoniously terms the wastage of marriage, but these breaches are being more than filled as year by year we send out more such students than before. Indeed, the demands for admission to the college are far in excess of our powers of accommodating the applicants. We realise that Dunfermline has become the centre of this branch of study, not only by your presence, but by the fact that we are from time to time receiving visits from important societies and deputations from all over the world, who all seem to obtain a certain profit

and satisfaction from what they see and hear. On the other hand, while they thus get good for themselves, they help to inspire us with larger and more intelligent ideas regarding our aims and the best methods of carrying them into effect, and when I say "us," I mean not only the Trustees and the officials of the Trust, but the community generally, who are brought to recognise that they are not only citizens of Dunfermline, but citizens of the world. As a general statement of our aims, we are content to accept the expression of them by our late Poet Laureate thus—

"All diseases quench'd by science, no man halt, or deaf, or blind ;

Stronger ever born of weaker, lustier body, larger mind."

We are now engaged in a hand-to-hand conflict with all the ailments which beset the young, and especially with those which require the patience and the attention which the busy practitioner cannot afford to give, but which so much affect the happiness and well-being of the rising generation. It is perhaps, however, not so much a warfare with ailments that we are concerned with as it is with those evils by which ailments are generated. These are insanitary conditions—dirt, improvidence, thriftlessness, ill-housing, bad ventilation, and their kind. We have been admonished by our former officer (a man stolen from us by the Department and now inaugurated as the chief of their physical education staff), that to stamp out disease it is not a cure that is wanted, but a method of prevention. To the same effect Dr. Leslie Mackenzie, in his recent report on medical inspection in Scotland, has assured us that literally in thousands of cases diseased conditions are permitted to develop that, taken in the early stages, could with perfect ease be prevented. After dealing with the statistics substantiating such a statement, he goes on to say that the question evoked everywhere by this continued output of "brute fact" is, "What is the use of medical inspection without treatment?" We all

enjoy the tempestuous language with which that (generally speaking) soft-spoken gentleman stigmatises the permission of preventable disease; but the whole circumstances which produce the brute fact are so provoking, and in most cases so readily preventable, that his language may be accepted as quite fitting. You will learn to-day something as to the force we employ in the conduct of our work. You will examine our baths and gymnasium, you will see the temporary apartments used for clinical work, and the permanent buildings in course of construction. On our staff we have four full-time doctors, one of them a lady, a skilled part-time dentist, two nurses, also a lady specially skilled in remedial gymnastics, and our students give a helping hand at the clinique, not only for the sake of the patients, but for their own sakes, as giving them a further insight into the nature of the ailments with which they will be called upon to deal in the course of their subsequent duties. Moreover, we have a band of ladies who, forgetful of the luxurious modes of living at their command, count it a pleasure to assist the nurses in humble offices which help the mothers to get over the difficulties which often occur in the rearing of their infants. Taking the work as a whole, it is delightful to think that it has become bound up with the well-being of the community, and has obtained sympathetic support from all classes. That good is being accomplished by the work is undoubted, and amongst the many ways in which it may be noted, I recommend you to take advantage of the opportunities you are to have of seeing some of our young people, and observe to what an extent we have succeeded in stamping the impress upon them of what is now widely known as "the Dunfermline mark." In conclusion, I repeat that we are delighted to have you with us, and we shall be glad to exhibit and explain to you all our doings. I feel that I have been lauding these very much to my own satisfaction, but I hope also to yours, and surely some indulgence is due to a speaker in praise of medical inspection who is favoured with an audience of school medical officers.

VI.

PHYSICAL EDUCATION.

By L. D. CRUICKSHANK, M.D., D.P.H., Medical Officer,
Scotch Education Department.

By way of introduction to my paper this afternoon I propose to give a rapid survey of the history of physical education in the schools of Scotland.

(A)—HISTORICAL.

The inclusion of physical education as an essential element in the school curriculum is of comparatively recent occurrence.

The first reference to "drill" in school is found in the Code of 1873. This regulation permitted time spent in drill to be reckoned as part of school attendance for grant-earning purposes. Sir John Struthers, in his evidence before the Royal Commission on Physical Training, states "that this provision was taken advantage of to some extent, and the number of schools in which military drill was taken increased gradually from 38 in 1874 to 495 in 1895.

"The Code of 1895 enacted that the inclusion in the curriculum of drill, or some other form of physical exercise, should be a condition of the higher grant for discipline. As a consequence, the number of schools taking military drill leapt in the following year from 495 to 848." In addition to those schools giving military drill many schools gave other forms of physical exercises.

"In 1899 the Department undertook a considerable reconstruction of the Code, and it is substantially under the Code as then reconstructed that the work is at present being conducted." Instead of physical exercises being a condition

of higher grant for discipline, it is now a condition of grant that the scheme of work provides for adequate physical exercises according to an approved system.

In 1902 the Royal Commission on Physical Training in Scotland was appointed "to inquire, *inter alia*, into opportunities for physical training now available in the State-aided schools and other educational institutions in Scotland, and to suggest means by which such training may be made to conduce to the welfare of the pupils."

The recommendation of the Commission with reference to physical training in the elementary schools is as follows:—"The improvement in regard to physical training will be brought about chiefly by a more intelligent conception of the proper aim of education, by a recognition of the fact that the education cannot be based on sound principles which excludes the training and development of the bodily powers, and by judging results as they are shown over the whole of school life, and not by short portions of that life—the school life to cover a larger part not only of the working time, but also of the recreation of its pupils. Larger provision of playgrounds and of exercise halls is necessary, and might with advantage take the place of a certain amount of classroom accommodation."

At the same time the Commission made the following recommendation with regard to medical inspection:—"School Boards should have the command of medical advice and assistance in the supervision of schools; the systematic record of physical and health statistics should be kept, and a small number of medical and sanitary experts should be added to the inspection staff under the Education Department."

The relations of medical inspection and physical training are set forth under the following heads by Dr. Leslie Mackenzie in his report on the medical examination of 600 Edinburgh school children. In his summary of conclusions in that report Dr. Mackenzie says:—

"First—The large number of serious and minor diseases directly or indirectly affecting physical efficiency and mental

efficiency constitutes an overwhelming case for medical inspection of school children.

“Second—The facts as to physical exercises at the various schools demonstrate that a primary condition of any good result from increased physical training is adequate food and adequate clothing.

“Third—No systematic exercise ought to be practised or enforced without a preliminary examination of the vital organs to ensure that irreparable damage shall not result.

“Fourth—That exercises should be organised—not, as at present, according to the Code standard in which the child is studying, but strictly in accordance with health, physical development, and vigour.”

These recommendations of the Commission were further supported by the Inter-Departmental Committee on Physical Deterioration in regard to physical training in the following terms:—

“It is desirable that more attention should be given . . . to organising games for school children . . . but the Committee are of opinion that no scheme of games alone can ever be made general enough to supply the place of methodical physical training.” They further urged the necessity of providing suitable accommodation for physical training.

Results of these Recommendations.

It will be interesting to observe the results of these recommendations on physical training. They may be summarised as follows:—

- (a) So far as the Code requirements are concerned they remain to-day substantially the same as in the year 1899.
- (b) In 1904 an Inter-Departmental Committee drew up the model course of physical exercises for use in schools. This model course continues to form the basis of the methods at present employed.
- (c) In the year 1902 the first inspector of physical

training under the Scotch Education Department was appointed. His duties were principally of a missionary character, and the advances that have been made in recent years are largely due to his efforts.

- (d) The number of expert teachers of physical education employed in schools has greatly increased.
- (e) Suitable accommodation for physical training has considerably increased. Most of the higher grade schools now possess a gymnasium or a central hall suitably equipped. The accommodation in elementary schools is still inadequate.
- (f) The work as a whole has reached a higher standard of efficiency, owing to the better instruction in the subject provided at the training colleges, and the larger number of experts now employed.
- (g) There is considerable evidence of increasing interest in the subject among school teachers and parents, but that interest is not yet so general as it might be. This is largely due to the lack of a clear conception of the aims of physical education and an imperfect conception of the proper aim of education.

Mr. Jamieson, H.M.C.I. for the Southern Division, in his last annual report, makes the following remarks with reference to physical training:—

“If physical training is everywhere to be put on as satisfactory a footing as most of the other branches of school education,” those responsible for its development have “a heavy task before them.”

Mr. Munro Fraser, H.M.C.I. for the Western Division, in his latest annual report, says that “the progress made in extending the provision for the teaching of physical training is steady and continuous, though not so rapid as could be desired.” The aggregate time given to physical training in the elementary schools is usually too short; the old-fashioned teacher, trembling for the safety of the three ‘R’s,’ probably thinks it can hardly be short enough.”

Speaking generally, we have perhaps no cause for complaint at the progress of physical education up to the present. The subject has had its share of attention as part of the general movement towards more hygienic modes of living.

Nevertheless the possibilities and aims of the subject have never been fully appreciated. This is, no doubt, due largely to the fact that the subject has not yet received much serious attention from the scientific mind. So far as I am aware, there are few scientifically grounded conclusions with regard to the hygienic or educative effects of systematic progressive physical training. But I should hope that we are now in a position to put to the test its value as a hygienic agent, both on the preventive plane and on the remedial plane. We are, I believe, about to enter a new phase in the history of physical education in Scotland.

(B)—THE ORGANISATION OF PHYSICAL EDUCATION AS AN
INTEGRAL PART OF THE WORK OF THE SCHOOL MEDICAL
SERVICE.

As medical inspectors we should take a comprehensive view of educational hygiene. It is perhaps true that the amount of detail involved in systematic medical inspection, "following up," and treatment tends to mask the larger issues. But while we inspect and treat we should also think of the means within our power by which we may be able to build up the physique and resistance of all school children.

It has fallen to the lot of educational authorities to supervise, and to some extent to contribute to, the physical well-being of all school children. All the factors falling within such an undertaking should be correlated, controlled, and directed by the medical officer. It is only reasonable that efforts to detect and cure disease and physical unfitness should be accompanied by efforts to prevent such disease and physical unfitness.

A broad general system of constructive hygiene should form the basis of the entire work of the school medical inspector. It is needful to guard the health of the normal child quite as much as to seek out and remedy the disease

of the abnormal child. In a comprehensive scheme of educational hygiene every school child should have his place and receive his due share of attention. Attention should be centred not merely on disease. The child, and not disease, should become the main point of interest. Diseases such as the school medical officer meets are merely incidents in the lives of a few of the children for whose general welfare he is partly responsible.

Taking this wide view of his duties, the medical officer will naturally seek out and utilise to the best advantage schemes that aim at improving the physique of all school children. One such scheme already exists in physical training. This subject already forms a part of the curriculum of every school. It is already sufficiently organised to form an excellent basis for the development of a more comprehensive scheme of physical education.

Physical education is finding its true place in the school curriculum rather slowly. This is perhaps due to some extent to the want of a clear conception of what is aimed at, and of a careful consideration of the means by which the end is to be attained. Personally I feel that until this subject receives from the medical officers the serious attention that it merits, its development as a school subject will be slow and unsatisfactory.

But it is not, primarily, as a school subject that I would urge the inclusion of physical education as an integral part of the work of the school medical service. It is rather with a view to the development of the subject on the lines suggested in the memorandum on Medical Inspection and Supervision of School Children. In regard to physical training as preventive treatment, the memorandum says, "Physical training affords many excellent opportunities for the daily examination and supervision of the children, and if conducted with due regard to each child's condition as revealed by medical inspection, may itself become one of the most important methods of medical treatment, both curative and preventive; for instance, proper exercises in breathing may be all that a child of tubercular tendency

needs to prevent the development of tuberculosis of the lungs. By correctly adjusted exercises carried on under correct hygienic conditions the children may be so improved in their physical health as to throw off or resist effectually many of the ailments associated with the school ages. The school may thus be made a place not only for physical and mental training, but also for the forming of hygienic habits and the building up of sound constitutions."

The aim of physical exercises as a school subject should be regarded as mainly hygienic. As such it should be under the control and direction of the medical officer whose duty it is to supervise the whole field of educational hygiene. To place this subject under the control of the medical officer may to some extent increase his work and his responsibilities, but at the same time it would place within his power a factor of enormous importance. It would form a sound basis for the fuller development of a comprehensive scheme of educational hygiene. Physical efficiency, as demonstrated in a high standard of physical training, might be regarded as the central stem of the inflorescence of youth, the basal structure that gives origin to and effectively supports all other fruits of personal hygiene. Under competent instruction the physical training lesson would form an excellent systematic hygienic survey of all school children. It would provide a carefully graduated test of organic vigour, a standard test of carriage, brightness, alertness, and a general capacity to enjoy existence. It would provide a test for undue and persistent fatigue, a method of estimating the relative amount and quality of exercise most suitable to different ages and sexes. It would afford opportunity for scientific observation, and experimental inquiry on the effects of systematic training on mental and physical development.

It would also offer a field for the possible elaboration of a series of graduated exercises on both the hygienic plane and the remedial plane, applicable to the normal and the subnormal. We may even hope to see ultimately a series of hygienic and therapeutic exercises developing side by side, and applied

in school to children in varying states of physical efficiency. Already classes for therapeutic purposes are being formed in some of our schools. A closer study of the possible effects on physique of these therapeutic classes would probably throw light upon the advisability of instituting relays of such classes, through which all subnormal children might be able to pass until they reach the normal hygienic exercises for their age.

In short, physical education is a largely unexplored field so far as it affects the hygiene of youth, and the time is ripe for a carefully considered series of investigations and experiments on its true place in hygiene and in education.

But how may the school medical officer undertake the supervision of this subject?

In the first place, he must have competent assistants in the form of commissioned officers to work under him. These already exist in the experts in physical education. Practically every School Board and every county has one or more whole-time experts of physical education. These experts have in most cases continued to teach their subject without any clear connecting link between the medical service on the one hand, or the educational curriculum on the other. They are in many respects in an anomalous position. They belong neither to the medical service nor, strictly speaking, to the ordinary school staff. Rightly they should belong to the "educational hygiene" staff, *i.e.*, they should be subordinate to the school medical officer. They should be his chief intermediaries between the purely medical aspect of his work on the one hand, and the educational aspect of his work on the other. It is through the physical training expert that the medical officer should keep in intimate and vital touch with the school, the child, and education.

Where school nurses are at present employed their work need not be disturbed. There is ample room for this closer link between medical and educational work—a link that the ordinary school nurse cannot form.

Where no school nurse exists the special qualification of

the physical training expert (if a woman) might enable her to assume certain of the functions of the school nurse in the schools that she visits.

The students of Dunfermline Training College are now receiving, through the agency of medical inspection and the school clinics, a special training that should render them of great service as members of the staff of the school medical service. Moreover, for several years the Physical Training College has given to all its students a special training in medical gymnastics. This training enables experts in physical education to undertake, under medical supervision, the treatment of deformities and certain other ailments that benefit from massage and gymnastics. Those experts are therefore already in a position to undertake a certain amount of actual treatment under the supervision of the school medical officer.

It would be difficult, almost impossible, to efficiently correlate at once medical inspection and physical education to the extent I have suggested; but I think it must be apparent to those that have given serious thought to the matter that this blending of two mutually dependent branches of work is highly desirable.

Arrangements are about to be made to increase the time given to physical education in the training colleges, so that in future all teachers will undergo a course of instruction equivalent to that at present undergone only by a few that take it up as a special subject. It will thus be seen that every encouragement is being given to the development of physical education; and it is hoped that by proper correlation with kindred branches of work the subject may prove itself worthy of the importance assigned to it.

(C)—PHYSICAL EDUCATION IN OUR SCHOOLS.

As you are already aware, the physical training at present given in our schools is based upon the Swedish system.

I do not propose in the short time at our disposal to-day to say anything about the system of training. I merely wish

to direct attention to what I conceive to be the essential points in physical education, and to indicate broadly how these may best be obtained.

(1) *The Essential Elements in Physical Education.*

A comprehensive scheme of training should aim at producing certain hygienic and educative effects, the cultivation of a certain degree of organic vigour or power of endurance; the development of self-control, both subjective and objective; and at stimulating the formation of certain moral qualities.

Ordinary school gymnastics provide for all these. But some of the effects are primary and some secondary. The primary effects are the hygienic and the educative. The secondary effects are endurance, control, and the moral effects.

Of the primary aims of the training, I shall refer only to the hygienic.

This primary aim may be considered under the heads of—

(a) Developmental.

(b) Corrective.

(a) *Developmental.*

This aim is realised by a series of exercises so arranged that they shall bring into use every part of the body with due regard to its functions and needs. But the exercise must be productive of a satisfactory stimulation of respiratory and circulatory functions. This general stimulating effect of exercise is of fundamental importance. Direct stimulation of the nutritive functions in actively growing children is a prime necessity of physical well-being. It should therefore be the aim of all physical education, whether formal or informal, collective or individual, to secure such stimulation. Not only does vigorous stimulation of nutritive processes react beneficially upon physique, but it is through such stimulation that the majority of the educative influences of

physical training may be most effectively secured. Were we to consider the educational value of physical exercise we should find that deficient stimulation may account for failure to attain desired educational results. The reason for this is that vigorous stimulation of circulation and respiration leads by a well-known sequence of physiological events to general stimulation of the nervous system, true stimulation of which means increased capacity for receiving and storing mental impressions.

General stimulation, however, is sought for a specific purpose. It is not sought as an end in itself, but as a means of stimulating harmonious organic development. Nor can we always be sure that a certain amount of stimulation shall be accompanied with a correspondingly beneficial result. In fact, it is here that we find the greatest difficulty in determining the effects of systematic training. Growth and development are closely related to many factors, such as food, rest, environment, and the like. Stimulating physical training cannot therefore be regarded as the sole agent in the production of sound physique. It is to be regarded rather as essentially an integral part of organised educational hygiene. It therefore becomes necessary to study the child's educational hygiene as a whole, to determine what part physical education may rightly be expected to play in the production of a normal physique. Its results should be estimated both quantitatively and qualitatively for each child.

(b) Corrective Aim.

This is of secondary importance to the developmental aim.

Much of our present system of physical education is founded largely upon a remedial basis, perhaps too exclusively so for the general purposes of physical education. There is a tendency to concentrate attention upon the corrective element to the loss of the stimulating element.

Concentration of attention upon precision of movement and final positions in individual exercises is highly desirable. But such concentration of attention upon individual exercises

does not necessarily produce a satisfactory total result. Indeed, it frequently happens that the individual movement is perfected at the expense of the desired total effect of the lesson. The stones of a building may be well and truly laid, but the architectural effect may be very disappointing. So with the physical training lesson. Individual exercises may be carried out with precision and neatness, but the total effect of the lesson may be nevertheless unsatisfactory.

Fortunately, the effects of corrective exercises are not difficult to estimate. The total effect should be seen in the general bearing of the children. I consider "marching" as one of the severe tests of good corrective work. If children do not carry themselves well in "marching," the corrective work is not producing the desired results. But good carriage should be maintained "off parade" as well as "on parade."

(c) Secondary Effects.

The secondary effects are those of endurance, control, and certain moral effects.

The question that emerges here is, are these secondary effects of much importance? Regarded from the point of view of character building as opposed to the development of physique, they are considered very important. But their development in school gymnastics is secondary or incidental. When we rely upon incidental methods to produce certain results, those results are not always highly satisfactory. They are apt to be somewhat casual and fragmentary. Therefore the system of physical education that depends solely upon incidental methods for obtaining these effects is lacking in one of the main purposes of physical education as an element in educational procedure. Formal gymnastics do not therefore of themselves constitute a sufficiently comprehensive scheme of physical education.

If we consider the effects of games, we find that the effects that are secondary in formal gymnastics here become primary, and the primary effects of school gymnastics become secondary. Gymnastics and games may thus be regarded as

complementary in physical education. A combination of the two gives better all-round hygienic and educative results than either alone.

If we compare a little more closely the relative advantages of gymnastics and games, we find that the aim of gymnastics is to secure harmonious development through set formal movements definitely arranged and capable of predetermination as to results. In games the aim is the "game." The movements will depend on the nature of the game, and will vary within wide limits. The movements are not under the control of the teacher, and are not easily determined as to results. As far as physical results are concerned, gymnastics will succeed where games sometimes fail. But the advantage lies with gymnastics only in the accuracy with which we can determine physical results. They cannot compare with games in the broader disciplinary values.

Dancing also has a useful place to fill in physical education. Apart from its educational value, dancing is an excellent form of exercise. It gives free play to an innate desire for emotional expression. The sense of pleasure in dancing usually, among Scottish people at least, far exceeds that in either gymnastics or games. The rhythmical action of the muscles in a state of mid-extension enables the performer to undergo prolonged muscular exertion with a minimum of fatigue. On this account, dancing is an excellent means of obtaining a sufficient amount of vigorous stimulation without the production of undue fatigue.

A comprehensive scheme of physical education should therefore give due regard to formal gymnastics, games, and dancing. Gymnastics should be founded upon a physiological basis, and should be capable of being grouped to suit the needs and capacities of children of different ages and of varying physique. Games should be well chosen, graduated as far as possible, and correlated to the gymnastic movements. The dances should be carefully selected to suit the physiological and social conditions of the times, and of a type in which children are simultaneously engaged, and that affords sufficient stimulation.

(2) The Teaching of Physical Education.

It will be clearly understood that success in teaching physical education will, to a large extent, determine the results. Here, as in other subjects, an imperfect conception of fundamental principles will lead to imperfect teaching of the subject.

The efficient preparation of a lesson in order to secure satisfactory total results is a matter of considerable difficulty. In fact, under normal circumstances, this can only be efficiently done by an expert. Even the expert sometimes has a tendency to over-estimate the importance of certain of the subsidiary aims to the loss of the primary aim. In the compilation of the physical training lesson therefore, while secondary aims must not be overlooked, the primary object of the lesson should be clearly in view.

If I may offer a criticism of the work in our schools in general, it is that the primary object of physical education is far too frequently overlooked. Subsidiary though not unimportant aspects of the physical training lesson may be brought out admirably. In fact, were one to judge solely from the precision and finish of individual movements, no fault might be found with the lesson. But I should like to point out that where the lesson takes on this character, that is, where the corrective element predominates, or is regarded as the primary aim of the lesson, the stimulating element becomes secondary, and much of the value of the lesson is lost.

When a child is brought to a physical training lesson, whether we conceive it to be correct or not, he naturally considers exercise to be the primary object of the lesson. Now, exercise to a child has a fairly definite meaning. At any rate, he craves for a considerable degree of stimulation. The exact form of the exercise in any particular case may not be of great interest to the child so long as he gets the exercise. Now, to impose upon a child the practice of a series of special exercises that do not afford the stimulation that he conceives to be the primary object of the lesson

is to court defeat of the purposes of the lesson. Moreover, one of the objects of physical training is to establish control of mind over body, or psychologically to increase the efficiency of the association tracts within the brain. Association is not readily established when movements are performed mechanically, and when the results of association are persistently unpleasant, repetition, so far from strengthening habits, tends to discourage them and break them up. Monotonous repetition may be of little effect either for good or ill, but disagreeable exercises create a repugnance to the processes involved that may actually unsettle the associations. It follows therefore that anything that becomes merely mechanical or unpleasant should have no place in the schools.

If therefore we hope to obtain the best results, whether hygienic or educative, in our physical training work, one of the primary things to be kept in view is, that we must aim to satisfy the desire of the child for exercise. Having satisfied that desire, or, at any rate, enabled the child to know from previous experience that his desire will be satisfied, we at once establish in the child an interest in the lesson. Until that interest is established, neither satisfactory hygienic nor educative results may be looked for. The absence of interest through failure to make the lesson sufficiently stimulating is the essentially weak point in the physical training of our schools. When we are successful in abolishing stale, mechanical, unstimulating work, we shall then be in a position to consider the next step in raising physical education to a still higher plane.

To teach a class in physical training so as to secure the best hygienic and educative results is a task of considerable difficulty. It is essential that the teacher should appreciate thoroughly the purposes and aims of the lesson, otherwise the results are certain to be disappointing. I hope that the demonstration classes you are about to witness in the gymnasium will be good examples of how to combine spontaneity, vivacity, and sustained vigorous exercise with good control and discipline so as to produce the best hygienic and educative results. The skilled teacher may be able to get all the

desired results even where most of the lesson is devoted to formal gymnastics. But where classes are not in charge of an expert, the most satisfactory results are obtained by the inclusion of games, or dancing, or both, in the gymnastic lesson. In a half-hour's lesson it would perhaps be best to get through the greater part of the formal gymnastic table within the first fifteen to twenty minutes, and to spend the remainder of the time in games or dancing, completing the lesson with the usual calming and breathing exercises.

(3) *The Accommodation for Physical Education.*

But when all these points have been attended to, physical training may entirely fail to give the results we wish, unless it is carried on under the best hygienic conditions. This is a matter requiring the strictest supervision by medical officers. If the classes are held in school or in a gymnasium, ventilation should be as free as possible, and the floors should be scrupulously clean. All sorts of excuses are made for defective ventilation and dirt. We should have absolutely no sympathy with such excuses. Physical education may be positively harmful unless carried on under healthy conditions, and it is our duty to see that these conditions are provided. If open-air conditions are not obtainable within the school building, the work should be done outside, even although some of the finer movements should have to be sacrificed.

(4) *The Results of Physical Education.*

I should like to say a word or two on the estimation of results. This is a difficult problem. Physical education, unlike other school subjects, is incapable of the same direct methods of estimation as to results. We teach physical training not primarily to enable the child to perform accurately and gracefully a certain series of movements. These movements are taught with a view to producing more or less specific effects upon physique and character. The demonstration of physical exercises by a class is therefore of comparatively little value as a means of estimating the effects of the training. It is in the estimation of the effects

of the training that we meet with our chief difficulty. There are no simple direct methods for such estimation. It is vitally important, however, that careful systematic investigation into this subject should be conducted. There is here an important field of inquiry in which, by scientific investigation, medical officers may be able to do much good work. The judicious correlation of physical and mental education, the increase of time that the subject deserves, the conditions under which the training should be given are matters that can only be satisfactorily obtained when the necessary scientific facts relating to the subject as a means of developing physique and character have been more fully investigated.

DEMONSTRATION OF PHYSICAL EXERCISES.

Dr. Cruickshank's paper was supplemented by a series of demonstrations of physical exercises for children of different ages. A programme was carried out under the direction of Miss Holmblad, Miss Sutherland, and Miss Armour, of the staff of the College of Hygiene. [A company of infants from five to six years of age performed the various exercises which were presented to them as games, and are so invested with an imaginative interest. The exercises have attractive titles, such as "Ships in the Wind," "Walking across River," "Seagulls Flying," "Balloons," "Striking Matches," and so on; while the tender muscles and physique of the infants are scientifically exercised during the progress of these "games." Juniors, aged nine, followed with a course of exercises a little more advanced; and seniors, aged twelve, also demonstrated their exercises.]

The women students in training at the college then gave a series of illustrations of the higher work of physical training, including dancing. These demonstrations were conducted in the splendidly equipped gymnasium of the college, where the visitors were entertained to tea.

Sir William Robertson, on behalf of the Trust, stated how much the visit of a body of experts had been appreciated by those responsible for the college. Dr. Ernest Roberts thanked the Trust on behalf of the conference.

VII.

THE MEDICAL EXAMINATION OF CANDIDATES FOR THE TEACHING PROFESSION.

By WM. DARLING, M.A., M.B., Ch.B., D.P.H., F.R.C.S.E.,
Lecturer on School and Personal Hygiene, Edinburgh
Provincial Training Centre.

Dr. Cruickshank made a few introductory remarks on the general question of the medical examination of candidates for the teaching profession. Specimens of the relative Forms (37T, 9T, and 189) were handed round. It was pointed out that, normally, each candidate had to undergo three separate examinations, namely, one on entrance to the Junior Student Training (Form 37T), one on entrance to the Training College (Form 9T), and one on the completion of the Training College Course (Form 189); that in order to avoid the possibility of subsequent rejection it was extremely important that the medical examination of candidates for the Junior Studentship should be conducted with the utmost care, and that for obvious reasons it was preferable that this medical examination should be conducted by the school medical officer.

DIFFICULTIES in diagnosis and prognosis are not so common, at least not commoner than in ordinary life insurance work. The difficulties arise from the general medical aspect of the cases in relation to regulations and various considerations in the mind of the examiner.

Let me refer, not in any special order of importance, to some of these considerations.

1. The candidate must be physically able for the work in front of him.

2. *Teachers' Superannuation Fund*.—There exists a pension and break-down fund for teachers.

The conditions of eligibility for a pension are practically the same for a teacher as for a civil servant; but the civil servant's pension is on a non-contributory basis, and is guaranteed by Government, while the teacher's is on a contributory basis, and the benefit he derives depends on the prosperity of the fund. This fund belongs to the teachers, and represents, in some part, their savings and earnings.

The Government safeguards its pension and break-down expenditure by a most stringent medical examination. The civil servant must be a first-class life. The Government allows no give and take.

On purely financial grounds, and in justice to the teaching profession, the medical examination in the case of teachers should be even more strict, if that were possible, than in the case of civil service candidates. Further, considering the work and influence of the two services, the country's need for teachers to be first-class lives is much greater than its need for civil servants to be first-class lives.

3. *Supply and Demand*.—The number of persons physically and socially fitted to become candidates for the teaching profession is vastly beyond the requirement. If the supply is not forthcoming, it is because the conditions of service are not enticing enough.

The importance to the country of having the best possible teachers is so great that, if the demand does not attract the supply of the right material, we should not be parties to pushing forward a cheaper and inferior article.

4. The community acquires a vested interest in the candidate in ratio with the amount of public money expended on his training.

5. The interests of the candidate have to be conserved.

It is manifestly unjust to pass and take contributions from a teacher who has more than the average probability of

breaking down or dying before drawing any benefit from the superannuation fund. We further do such a person a grave injustice in not advising, permitting, or even compelling him to use his contribution in paying into some insurance scheme more likely to benefit him.

In the case of those likely to break down earlier than the average, an injustice is almost certain to ensue, either to the individual, if he break down before break-down allowance is permitted, or, if later, to the fund.

One has to consider at what stage a candidate acquires "rights" to further training and admission to the teaching profession.

I have been accustomed to think of the junior student as a person receiving privileges and acquiring no—or, at least, minimal—rights and duties. He is not compelled to continue, nor is the Government compelled to accept him, as a teacher. As a junior student he has received advantages in general education which more than compensate him for the time he has spent in special training. The Government has a claim on him, but not a very strong one, for the tendency of the times is to bestow this good, general education on all members of the community. Still, if he has acquired a minimal right, the recognition of this right might induce an examiner to pass a very slightly doubtful case.

When a candidate enters on his training under the Provincial Committee, he continues to receive privileges, but is now acquiring rights and assuming duties—rights to have his training recognised, a duty to teach for a certain number of years to repay the community for moneys expended—but he is not acquiring a right for special consideration in being admitted to the benefit of this fund. This fund is made up largely of the compulsory contributions of teachers, and exists solely for their benefit. Could any authority with justice decide that a person medically uninsurable but professionally eligible must be admitted to the benefits of the fund because he only became uninsurable while striving to enter the profession?

6. All certificated teachers must be insured under this teachers' superannuation scheme.

This ought to mean, according to my interpretation of this requirement and of the conditions of the teachers' superannuation scheme, that the candidate must be physically fit to teach, and be also a first-class life from an insurance point of view.

Some candidates, at their final medical examination, are found physically fit to teach, but far from being first-class lives. Some of the defects have developed during their training; others have been previously overlooked. It is extremely difficult to "spot" all defects in the absence of a reliable personal and family history. The histories we receive from candidates, generally speaking, are worthless and unintentionally—occasionally intentionally—misleading. During the close medical supervision of the two years in college, grave, unsuspected defects are sometimes discovered which, while not affecting the candidate's fitness to teach, render his life uninsurable at ordinary rates.

7. The last and most important consideration is the conception of the duties of a medical officer of an educational authority.

The justification for the existence of such medical officers is their endeavour to improve the public's conception of what health is, and to create what may be termed a "health conscience." The work we do—lecturing, examining, treating—essential in itself, perhaps, is subservient to this end. We have unrivalled opportunities and means to carry on this propaganda. All who pass through our hands should become more or less efficient missionaries for the cause. He will most probably be a very poor missionary who passes through and leaves with remediable pathological conditions.

I would advocate the use of all legal means and extreme persuasion to induce attention to remediable conditions, and a student who neglected to follow out advice given I should like to see rejected or his final acceptance postponed, even although he were physically fit to teach and insurable.

I have dwelt perhaps unduly on these points, but it is directly out of them that the mass of our difficulties arise.

In all the following cases the candidates were fit to teach at the time of examination :—

Heart Cases.—If it is going to remain a regulation that every teacher must be pensionable, it is obvious that the first medical examination must be very searching, and little discretion allowed examiners. No organic lesion should be passed.

A certain number of cases will escape the examiners, or will develop during training. For instance, this case—Loud mitral systolic murmur—organic or congenital—no previous history—cycles and plays football—was quite unconscious of any handicap. Of course, it may be said that this case should never have reached the final medical examination, but it has, and now the question is, what is to be done? Here is another—Passed eighteen months ago, with note, “systolic murmur in mitral area, probably functional.” Examined now, and diagnosed organic mitral systolic.

Serious disease or progressive disease of any important organ should bar the entrance of a candidate for training. But when the condition is discovered at the end of training, and the candidate is fit to teach, what is to be done? It is hard that, because he is unpensionable, he should not be recognised as a teacher, and it seems foolish for the community to refuse what return he can give and is anxious to give for the expense incurred in training him. Thus the following case was passed as a first-class life eighteen months ago :—Now has systolic murmur, probably hæmic—some-what anæmic—fit to teach now. This candidate is not pensionable, but may become so. The difficulty would be overcome if a temporary certificate were granted for one or two years, the certificate to be made permanent when the student furnished a satisfactory medical report, or when pronounced permanently uninsurable.

Should such a case as this present itself at an earlier examination, *e.g.*, on becoming a junior student, what discretion has the examiner given him? In the light of what has already been said, he has none, and unless he can say

definitely (and he cannot) that it is not an organic murmur, he must reject or postpone the candidate.

Tobacco hearts are occasionally met with. I should like to see them treated similarly to the preceding case.

Lung Cases.—Towards the end of first session a student developed definite signs of phthisis, and was sent home; returned to work later, apparently well. There are no signs now, and there is every appearance of robust health. Here the student is fit to teach, but should the history involve rejection for pension?

Anæmia.—Our experience is that “anæmias” not merely stand the training well, but improve during the period of training, so that now we find it sometimes difficult to determine what is best in the interests of the health of the anæmic entering student, *i.e.*, to pass or to postpone. There has been as yet no difficulty in passing these cases after two years in college. Here is an illustration—Well pronounced chlorosis—cardiac murmurs—marked for rejection, but reluctantly passed because of history of regular attendance and absence of petty illnesses as junior student. At exit examination passed without remark.

Neurosis.—How to deal with neurotics or suspected neurotics is an extreme difficulty. Long-lived, healthy neurotics drawing breakdown allowance are the bugbear of insurance funds. No general rule can be laid down. Such cases as occur show the urgency of extreme care at the junior student stage.

Defective Senses.—Defective hearing and defective seeing among the senior students have caused remarkably little difficulty.

Remediable and Arrestable Pathological Conditions.—Pediculosis, septic teeth, suppurative middle-ear disease, enlarged tonsils, adenoids, hernia. The attitude of the examining officer towards these conditions is much more important than the mere safeguarding of a pension fund. Here is afforded an unrivalled opportunity of helping to create what has already been referred to as a kind of “health conscience,” and of making a body of teachers *practically*

equipped to be our missionaries. Tactful persuasion and discretion must be used, for every one is anxious to avoid rejecting for remediable conditions unless they are very gross.

Let me take teeth as an example to indicate some of the difficulties.

As junior students candidates are warned individually about any bad teeth. As students in training they receive a printed notice before the first session begins advising that defective teeth be attended to. Notwithstanding this, 90 per cent. of the students may come up with at least one tooth in a state of decay, and many with positively foul mouths.

After the students come up medical examination begins, and each student is advised. They promise, but apparently think that that is the last of it.

In Edinburgh lists are kept, and each term defaulters from the previous term are called on to appear. This entails a lot of unpleasant work to the medical officers. The students think it a bore or an unpleasant necessity to appear before the doctor, and, once the interview is over, forget all about it until called again to appear. They quickly learn that the medical officer will not recommend for this condition the rejection of so many students. They argue thus—Mary Jones has five bad teeth, and I have only two, and she has not had hers attended to, &c.

The medical officer has no power. To make it a matter of college discipline is undesirable except in extreme cases. Such appeal to authority will not improve the relationships of patient and physician.

The medical officer might recommend rejection, but this is extreme. To prevent a student from earning his living for six months or a year, not because of his physical condition, but because of this breach of discipline, would raise an outcry, and would be distasteful to the medical officer.

If the medical officer had power to recommend the granting of a temporary certificate for, say, a year, and if the teacher were compelled to produce a satisfactory medical certificate before his teacher's certificate was made permanent, that would be a power which the medical officer

would readily use. He would feel his conscience salved in reference to some of the half-believed plausible excuses, *e.g.*, financial inability, and he would not feel that he was depriving some unfortunate student of bread and butter.

DISCUSSION.

Dr. W. Jones Mackinnon (Lanarkshire) said the County of Lanark Secondary Education Committee has given permission to the Boards with junior student centres in the area to avail themselves of the services of the school medical officers for examination of junior students (entrants) if they so wish. Most of the Boards in the county have taken advantage of this, and it is the intention of the school medical officers to re-examine these candidates each year during their course of training. Should any defect which would render the candidate liable to rejection at the end of the junior student training have developed since the last examination, the candidate would be advised to withdraw from the course.

Dr. George A. Williamson (Aberdeen Provincial Committee)—With reference to the examination forms submitted, I should like to point out that the form filled in by the medical practitioner examining the junior student never reaches the medical officer of the Provisional Committee on the student entering the training college and coming up for medical examination by that officer; it is a great pity that the information gained at the first examination should not be available at the second. Dr. Cruickshank has referred to the objection to the private practitioner (possibly the family doctor) and not the school medical officer examining junior students. As an example, I may quote the case of a student with well-marked curvature of the spine who had been passed in this way as a junior student; in accordance with the instructions in form 9T, such a student had to be rejected, but she was allowed to continue her study paying her own fees, and now it has been my duty to once again reject her on her completing her two

years' course of study, and I should be glad to know what is to happen further in her case. It would be interesting to know what the position of the student is to be pending receipt of reply from the Department to the case submitted, as suggested in form 9T, on the back of that form—The director of studies is anxious to know definitely from the medical officer whether the student is to be accepted or not, or, if the student proceeds to engage lodgings, buy books, &c., she may find that she has put herself to unnecessary expense in the event of rejection being the Department's decision. May I submit a case of difficulty? A student, on coming up in October to begin his second year of study, complained of a cold he could not get rid of. Examination revealed the condition to be one of pulmonary tuberculosis, with tubercle bacilli in the sputum; he entered a sanatorium for treatment, and, after a year, returned apparently quite well, and obviously strong. He has completed his second year of study, and I have now passed him as fit, submitting, at the same time, an account of the history. May I reassure myself that I have acted wisely? On Form 189 information as to teeth defects is called for, and I should like to know the exact value of this information, having regard to the fact that the students are passing out of the college, and are no longer to be under the control of the medical officer, even during the two years' course of study, as there is no penalty attached to neglect to obtain treatment. Such neglect is very common, and Dr. Darling's plan of postponement of granting of certificate suggests a method of enforcing attention to advice given. Perhaps Dr. Cruickshank will be good enough to give us some indication of the attitude of the Department to the questions raised.

Dr. Donald Murray (Stornoway)—I fear that I am going to utter a heresy in suggesting that it is possible to carry the medical examination of candidates for the teaching profession too far. (We are now told that all certificated teachers must pass as first-class lives, and even threats of rejection are uttered if the teeth are not up to the mark. The ability to teach must not be confounded with the interests of the

pension scheme. In days gone by very often men became teachers because they were not physically fit for other forms of work. Now the pendulum has swung to the opposite extreme, and the teacher must be perfect in body in addition to having a highly trained mind. As a result, the State is in danger of losing the services of many men and women who would give splendid work as teachers for ten, twenty, or more years on account of some physical defect which might potentially affect the financing of the superannuation scheme. There are possibilities of grave injustice to aspiring teachers. The medical expert is apt to find himself up against the common sense of the community. So many activities and professions are now being absorbed by the State that, if all are to be subjected to this rigid examination, what is to become of those rejected as unfit? Even the doctors are being taken over by the State. We were not medically examined, and yet those I see here seem quite fit. Some of the best work in the country is being done by men who could not pass a medical examination, and I think we should call a halt in this tendency to make physical perfection a *sine qua non* for admission to the teaching profession. While on my feet, I should like to support the chairman's appeal for more freedom in the infant room. Dr. Scougal should impress his views upon his successors in the inspectorate. The demon of discipline has done a great deal of harm to the younger scholars, and relaxation in this respect is very much needed in the interests of health, and no harm would result to education. I hope also that we shall be able to curtail the hours of attendance at school. I believe that, so far as the younger pupils are concerned, the hours could be considerably reduced, with resulting benefits to the education as well as to the health of the child.

VIII.

THE MEDICAL AND PHYSICAL EXAMINATION OF CANDIDATES FOR THE PHYSICAL TRAINING PROFESSION. °

By ALISTER T. MACKENZIE, M.A., M.D., F.R.S.E.,
Administrative Medical Officer, Carnegie Dunfermline
Trust.

This paper deals with the qualifications of women students only.

The amount of physical and mental work required from students at the Dunfermline College of Hygiene and Physical Training:—Rise at 7 a.m.; cold bath; breakfast, 7.45 a.m.; 9 to 10 a.m., lecture; 10 to 11 a.m., gymnastics; 11 a.m., milk; 11.30 a.m. to 1 p.m., games; 2 to 4 p.m., teaching in schools and swimming; 4 p.m., afternoon tea; 4.30 to 5.30 p.m., dancing; 5.30 to 6.30 p.m., lecture; 7 p.m., dinner; 8.15 to 9.45 p.m., study; 10.15 p.m., lights out. Daily hours of physical work, $3\frac{1}{2}$ to 4 hours; daily hours of lectures, teaching, &c., 2 to 3 hours; daily hours of study, including practice of gymnastic and dance movements and preparation of teaching work, $1\frac{1}{2}$ to 2 hours—total, 8 to 9 hours. Daily hours of sleep, 9 hours. Saturdays and Sundays free. The course of training extends over two years.

Such a course of training demands a good physique and good mental powers. But it is not enough to be strong; it is necessary to be well built, and to have some of the qualifications which make the good teacher. We desire to get promising material, not physical alone, but also mental.

The future work of the students demands enthusiasm, tact, and force of character, discipline, an intelligent and sympathetic attitude towards children, and (not least) some originality. We endeavour to turn out teachers who will be a credit to the institution, and who will do something to further the physical welfare of the child. Much depends on a wise selection of students.

Selection of Students.—Candidates for admission are informed that they must be medically fit, that they must be physically suited to the work, and they must produce evidence of a good education. None is admitted before the age of eighteen, and all have to be interviewed by me at Dunfermline. They have to submit to a medical examination by our lady doctor, and to a physical examination by the chief gymnastic instructress.

Educational Qualifications.—The educational qualifications of candidates are settled by the Scotch Education Department, and in the case of all candidates born in or after 1894 the intermediate certificate of the Department is expected to be held. This does not exclude candidates from England (*e.g.*) provided that they satisfy the Department as to their educational fitness.

MEDICAL EXAMINATION.

Apart from, and in addition to, the necessity for a high standard of general health and "soundness" required in their calling, teachers of physical exercises are possible claimants for retiring and disablement allowances under the superannuation scheme of the Scotch Education Department, and only first-class lives (to use an expression associated with insurance) are acceptable. One must also remember that all the students whose parents are not resident in Dunfermline reside in a hostel, and that we become responsible for their well-being, and desire to avoid the risks of illness. The medical examination is conducted on very similar lines to those which are used in the medical examination of scholars, and is recorded on the ordinary medical inspection cards.

Height.—It is essential that a teacher of physical exercises should have a good appearance, and candidates rather above the average height should be chosen. Very tall girls are less graceful in the execution of movements, and thus offer worse copy for their pupils. Small girls are usually neat. The average height of those girls selected last year is 5 feet $4\frac{1}{2}$ inches, and this is a good standard. It may be taken that candidates whose height is above 5 feet 3 inches are preferred.

Weight.—In regard to weight it is difficult to fix a standard with the same accuracy as in the case of height.

Heavy girls are either too fat or too muscular in type. In the latter case agility and grace are apt to be lacking; in the former there often exist an innate aversion to hard work and a want of vigour in their performances and in their teaching.

The thin girl, on the other hand, is usually energetic and keen, but she often lacks staying power, and finds the course too arduous.

The weight of a well-developed girl of eighteen who is 5 feet $4\frac{1}{2}$ inches in height should be rather above than below 9 stones for this calling.

Infectious Disease.—Although no preference is given to candidates who have already had the commoner infectious diseases, those students who have not had scarlet fever, measles, &c., are a source of anxiety in the hostel when epidemics occur in the schools. The students are constantly visiting the schools, and last winter we had five cases of scarlet fever in the hostel.

Other Diseases.—Inquiry is made as to whether candidates have had any serious illnesses, and any history pointing to abnormality of the heart or lungs is looked upon unfavourably.

Vaccination.—It is essential that all students admitted to the college be efficiently vaccinated, otherwise parents must take full responsibility for non-vaccination.

The teeth, eyes, and ears are examined, and no candidate is accepted who has bad teeth or a marked and irremediable defect of sight or hearing.

Nose and Throat—Speech.—Affections of the nose and throat are carefully looked for, and any defect which interferes with the proper production of the voice would place the candidate in the second rank. A history of sore throats and hoarseness is not less important than the existence of nasal speech and a bad accent. During the course of training and in after work the teaching of physical exercises requires much speaking, often in noisy central halls and in the open air. The majority of our students are at first ignorant of proper voice production, and special instruction is given to all students in the correct method of producing the voice. It is unwise to accept candidates who add to their ignorance of correct production the additional handicap of a long-standing naso-pharyngeal or laryngeal catarrh. We do not want shrill, strident voices, but we aim at a full, round tone and a vocal flexibility which can play on the minds of the pupils.

Heart and Lungs.—It is unnecessary, before a congress of medical men, to enlarge upon the importance of complete healthiness of the circulatory and respiratory organs in candidates for the physical training profession. All students must be perfectly sound in these respects. The presence of varicose veins is detrimental.

Blood Pressure.—A word on blood pressure. Sometimes a candidate appears who, although apparently healthy, has thickened arteries and a high blood pressure. This is a very abnormal condition in such young people, and it is a difficult question to decide whether the course of training and the work of teaching games, dancing, and other physical exercises is a suitable occupation for such an individual. I have not made up my mind at present whether we should accept such a candidate.

Hernia.—Of course, inquiries are made with regard to the presence of any hernia, and the examination is not completed without the medical officer satisfying herself that no hernia exists. In the course of training the abdominal muscles often have hard work to perform. A successful "radical cure" removes any objection on this

score, and strong, flexible scars of former abdominal operations are not detrimental to a successful candidature.

Menstruation.—Careful inquiry is made about the menstrual functions of all the girls who apply, and any marked history of menorrhagia or dysmenorrhœa disqualifies. Physical exercises can be so adapted as to be beneficial to every one, but the full course of training at a college such as the Dunfermline College of Hygiene and Physical Training is apt to single out defective organs and increase their defects. In the case of selected students there is a stringent rule against taking part in the exercises when these periodical stresses are active. With enthusiastic young women valour is apt to get the better of discretion at such times. I feel sure that in the early days of this calling, when women were not satisfied with any achievement which fell short of those attained by men, many women students of physical training injured themselves by constant practice of violent vaulting and jumping exercises, and continued to pay the penalty for such indiscretions years after their training was completed.

THE PHYSICAL EXAMINATION.

Presuming that a candidate is medically sound, strong, and healthy, there still remain some questions to be answered—Is she physically suitable for the work? Are the conformation and the proportions of her body such as will enable her to perform her exercises with precision and grace? These questions are important, not merely that we may have good material to display at any college demonstrations, but in order that the teacher may set a high standard of attainment before her pupils. You will note that I lay stress on grace and precision, and not on muscular force. The aesthetic part of education has been too much neglected in the past. ^o Our aim must be not merely “health and strength,” but health, strength, utility, and beauty. However, this is not the time to discuss the requirements of a system of physical training—Dr. Cruick-

shank has already given you an authoritative account of that aspect of education.

The questions which I have just raised (see above) have to be decided by an experienced teacher of physical exercises, and so the candidate is now handed over to the chief gymnastic instructress.

Carriage, &c.—She notes the carriage, walk, and type of movement of the candidate—does she move slowly or quickly, neatly or awkwardly?

Deformities.—In the course of this examination, special attention is paid to the spinal column, the chest, the shoulders, legs, and feet. Most candidates have poking chins and some slight lateral curvature of the spine, but these defects will remedy themselves in the course of training. On the other hand, marked over-development of one side of the body, distinct lateral curvature, flat chest, bow legs, and knock knees and well-marked flat foot would require special gymnastic treatment. Without such special treatment the course of training will not remedy these established defects, and time does not permit us to deal with them apart. Shoulders over-developed by excessive hockey and by application to the trapeze and parallel bars are well nigh hopeless from our present point of view, and candidates who present these defects are rejected.

Musculature.—The musculature of candidates is important, and I have already foreshadowed my remarks on this aspect of the case. The large, coarse-fibred muscles developed by a laudable but ill-directed devotion to dumb-bell exercises and to the similar slow, sustained movements described in the pamphlets which extol the virtues of certain "strength machines"—such muscles do not commend a candidate. The antelope has always seemed to me more youthful and more beautiful than the ox.

FINAL INTERVIEW.

After the candidate has undergone the scrutiny of the physical examination comes the final interview. In this one has to gauge the refinement and temperament of the

applicant, the extent of her education, her intellectual efficiency, and the vigour of her personality. "In addition to being physically fit, I think that candidates for the work of physical education should be temperamentally fit. The difficulty is how to estimate that state of mind. It might be done if there were instituted in a limited degree a junior student opportunity to teach in physical training—something of the nature of apprenticeship trials during the intermediate curriculum at a secondary school. Again, it would be well if a record of the moral tendencies and incipient 'sportsmanlike' capacities could be kept throughout the years of the intermediate course as these might be noted and valued by sympathetic teachers. Such things, though difficult to estimate and somewhat intangible, are of far more importance than the tabulated results of any 'subject' instruction. Again, that this line of work should receive its due place in the educational field, students should enter on their professional course as late in life, as mature in body and mind, and as well intellectually equipped as for other branches of the teaching profession, *i.e.*, they should aim at completing in general study and culture the full course of a secondary school qualifying for entrance on university instruction. Without introducing any caste feeling at all, I think some selective process on the ground of manners, tastes, and general bearing should be kept in view. I often feel that many good teachers (professionally considered) spoil their influence by being rude, boorish, and openly self-seeking."

Information from teachers and others bearing out that an applicant is well-disciplined, and that she has applied herself conscientiously and successfully to her former studies is always helpful. We inquire as to her interest in games, her previous gymnastic training, and the reason for her candidature.

You will conclude that candidates for the physical training profession have to undergo an exhaustive and searching examination, and that every effort is made to select students who will not only be physically suitable, but who will sur-

round their pupils with a good intellectual, æsthetic, and moral atmosphere. Our students must be tactful and sympathetic, and in every way suitable for the work which (we hope) will play an important part in the education of the young.

Summary of the more important points suggested—Age, 18; height, 5 feet 4½ inches; weight, 9 stones. Other diseases—Absence of history pointing to serious impairment of any organ. Teeth, eyes, ears—Sound. Speech—Important. No chronic disease. Good round tone and flexibility of voice. Refinement of speech is a great asset. Varicose veins and blood pressure. Hernia—Important. Menstruation—Important. Body—The type and proportions. The æsthetic element important. Carriage, deformities, over-development, musculature, coarse muscular type to be avoided. The intellectual type preferred to the muscular. Intellectual and moral side—Evidence desired of girl being well-disciplined; application as well as ability; refinement and good manners, temperamental fitness.

IX.

THE MEDICAL TREATMENT OF SCHOOL CHILDREN IN TOWNS.

By J. HALLY MEIKLE, M.A., M.D., B.Sc., D.P.H., Chief School Medical Officer to Edinburgh School Board.

It has been the duty of education authorities for some years now to make arrangements for the medical inspection of all school children within their area, but it is only within the last year that education authorities in Scotland have had the power, and only a limited power, to provide medical treatment in connection with defects found as the result of medical inspection. I feel sure that all who are engaged in school medical inspection will welcome this new departure. Most of us who have been engaged in school work for a few years have frequently had said to us that our work consisted mainly in the accumulation of statistics. Perhaps there was a certain amount of truth in the statement, but the great improvement that has taken place within the last few years in the general health conditions of pupils shows that real work of an ameliorative nature was being carried out, and that, too, without any powers for treatment such as we now have. To secure treatment for certain defects, especially for the poorer children in our schools, has been often a difficult problem, and, if medical inspection is to fulfil the object for which it was instituted, the improvement of the health of the school child, it is evident that this can be secured only by the education authority which is responsible for inspection making arrangements for treatment where this cannot be secured, either through lack of existing arrangements or through inability of parents to secure it.

The school medical officer welcomes treatment. It adds a new interest to his work, but, what is more important, it secures great benefits for the pupil whose need is greatest.

In considering the question of medical treatment, the first point to be considered is the nature of the defects that call specially for treatment by the education authority. These defects may be classed in two groups—

(1) Defects which prevent a pupil attending the ordinary schools.

(2) Defects found in the child attending the ordinary schools which either prevent him from taking full advantage of the education provided or render him for a time unfit to mix with other pupils.

Some of the defects mentioned in the first class do not call for special discussion here, but I have thought it well to state them with the others, so that one can have an idea of the comprehensive nature of the present-day education problem, and also the varied nature of treatment schemes to be dealt with by education authorities.

Dealing first with defects which prevent a child attending the ordinary elementary schools, we have five classes of pupils to mention—

(1) The blind.

(2) The deaf and dumb.

For both of these ordinary school instruction is quite unsuited.

(3) The epileptic—I mean here the sane epileptic, a class for whom in Scotland at present it is very difficult to secure education, and for whom in adult life it is now more difficult than ever to secure employment.

(4) Mentally defective pupils. The number of mentally defective children is estimated at, roughly, 1 per cent. of the elementary school population. Whatever the exact percentage may be, there are always in towns of any size sufficient of such pupils to call for special education and treatment.

(5) The physically defective. It is interesting to note how the meaning of the words “physically defective” has gradually broadened out. At first they were applied chiefly

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to crippled children—children crippled through paralysis, bone disease, rickets, &c. Later delicate children were considered, children suffering from anæmia, malnutrition, &c. This led next to the consideration of children suffering from tuberculosis in its varied forms, and we have now included children suffering from certain skin diseases, like ringworm and favus.

When we consider the second group of defects, that is, defects found in children attending the ordinary schools which either prevent the pupil from taking full advantage of the education provided, or render the pupil unfit for a time to mix with other pupils, the two defects that call for first notice are defects of eyesight and dental defects. These defects are not only markedly prevalent, but it is largely owing to medical inspection that the importance of their treatment is being now realised.

It is estimated that about 10 per cent. of pupils suffer from refractive errors calling for attention. Included here are strabismus, hypermetropia, astigmatism of varied sorts, and myopia of varied degrees. External eye diseases are estimated to be present in 3 per cent. of pupils, and include such conditions as blepharitis and the various forms of conjunctivitis so common in our poorer schools.

As regards dental defects, every school medical officer's report deals with the prevalence of dental decay and the impossibility of securing treatment for this defect without special arrangements being made.

Ear and nose conditions that call for treatment appear also in every report. The number of pupils suffering from adenoids and enlarged tonsils varies in different reports from 2 to 24 per cent. Deafness of various degrees less than total deafness is prevalent, while otorrhœa, both from the serious and often offensive nature of the trouble and the difficulty in securing systematic treatment, calls for special mention.

Skin diseases also receive special prominence now, on account of their prevalence, on account of the loss of attendance due to them, and specially on account of the difficulties in securing proper treatment, and this applies specially to ringworm, favus, and scabies.

Diseases of the heart and lungs, where special treatment is necessary, are dealt with under the physically defective group.

Reference must here be made to uncleanness in its various forms. Dr. Newman, in a recent report, says—"It is still, unfortunately, necessary, especially in some areas, for the school medical officer and his staff to spend a large amount of time and energy in combating conditions of uncleanness among children." I think we will all agree that it is still, unfortunately, very necessary.

Such, then, is a brief outline of the various defects that call specially for treatment. The list is a considerable one, but treatment of all the defects mentioned has been sanctioned, and has been carried out by education authorities.

In dealing with the organisation of medical treatment in towns, there are several points that must be mentioned. First, the number of pupils suffering from the various defects is considerable. In most towns there are already institutions which provide special treatment for some of the groups mentioned—this applies specially to the blind and deaf and dumb. Again, for defects calling for special skilled medical treatment there are existing institutions, with which arrangements for treatment can be made by school authorities if so desired, or, when treatment is to be carried out by the school authorities, there are specialists whose services can be secured. Another very important point is that financial difficulties in connection with treatment are more easily arranged in large towns than in country areas. It must also be remembered that the conditions in no two towns are exactly alike, so that a scheme that suits one town may need considerable alteration before it can be worked in another town.

Treatment for the first group of defects needs only a few words. Institutions for the education and training of blind and deaf and dumb pupils exist in most towns, and the duty of the school medical officer in connection with such cases is limited usually to the certifying of pupils as suitable cases for education in these institutions, the School Board defraying the cost of the education of each pupil. Reference has

already been made to the difficulties of securing education for epileptics. There are in Scotland, I think, only two residential schools for epileptics, admitting only a limited number. School Boards have the power to contribute towards the cost of the education of epileptics, and in some cases are doing so. There is no doubt, if there were in Scotland a central residential training institution for epileptics, School Boards would be found willing to exercise this power in many more cases.

Most large towns have now special schools for mentally defective pupils, and also for physically defective pupils. The latter include schools for cripples, open-air schools, or residential schools for delicate and convalescent children, and the class now called "pre-tubercular children." While there may be differences of opinion connected with the diagnosis of pulmonary tuberculosis, it is generally recognised that children suffering from definite pulmonary tuberculosis must, if treated, be treated separate from other pupils.

Special schools for children suffering from ringworm and favus also exist. They fulfil a useful function; they ensure that treatment is regularly and efficiently carried out without loss of education.

Other special classes that should be mentioned are the classes for the partially blind, partially deaf, and classes for stammerers.

In providing treatment for the second group of defects mentioned, there are two forms of treatment that seem specially necessary—treatment of dental defects and of errors of refraction. As regards dental defects, it is generally admitted that there are no existing arrangements by means of which this work can be overtaken. It might be said that existing hospitals and dispensaries could overtake the eye work, but correction of errors of refraction is not the primary function of these institutions; again, the number of pupils requiring treatment is more than can be examined at these institutions along with the other work there.

Admitting, then, that dental work and refraction work should be undertaken by the education authority, the pro-

vision of special staff, premises, and equipment is necessary. For dental work fully qualified dentists are appointed. The pupils treated are from six to eight years of age—the age at which permanent teeth are appearing. The dentist visits the schools, inspects all pupils six to eight years old, notes the condition found, sends intimation to parents when treatment is necessary, and, on parents giving their written consent to the necessary treatment being carried out, intimation is sent asking the parent to bring or send the child to the treatment centre. In the centre is a fully equipped dental room. The cost of this equipment varies, but at a cost of about £70 a very full equipment can be secured, including dental chair, electric engine, instruments, cabinet, anæsthetic outfit, and other necessary appliances. A nurse is in attendance. A general waiting room is necessary, and a recovery room for patients who have passed through the dentist's hands is also advisable. Inspection and treatment are in the dentist's hands. The school medical officer arranges which schools are to be visited, and also arranges for notification to be sent requesting pupils to attend for treatment at fixed dates. The number of cases treated per half-day of three hours varies; it depends on the number of teeth needing attention, but averages about eight to ten pupils. Of the pupils examined, about 80 to 90 per cent. require treatment of some sort.

For the treatment of errors of refraction the services of a specialist are required, and also premises specially equipped. All pupils found by the school medical officers to have defective vision are referred to the specialist. It is well here also to get the written consent of parents to a full examination, to avoid trouble that might arise from the use of atropine. Fully equipped premises, including dark room, with lamp and ophthalmometer and all necessary testing lenses, cards, &c., cost from £20 to £30. In connection with the prescribing of glasses, arrangements can be made for providing suitable glasses at a quite moderate figure. School Boards have the power to supply necessitous children with glasses, but it has been found in Edinburgh that, when the cost of the glasses

is reasonable, about 80 per cent. of the spectacles provided is paid by parents. The treatment centre can also be used for the measuring and fitting of spectacles on pupils by the optician who supplies the glasses.

With a centre thus equipped, and with nurses in attendance, treatment of many of the other conditions mentioned gradually develops. The number of cases of external eye diseases soon increases, these being referred to the centre by the school doctors. Cases of otorrhœa detected in schools and not receiving proper attention are sent to the centre for treatment. Cases of impetigo and neglected sores of all kinds are also treated.

For the treatment of ringworm and favus X-ray apparatus is required. This may be installed by the Board, and treatment carried out under the direction of a specialist; or a Board may make arrangements with infirmaries or hospitals to have treatment carried out on their premises. If X-ray apparatus is installed at the medical centre, then the necessary treatment and examinations connected with skin diseases are carried out there. Where a school exists for children suffering from skin diseases a nurse is in attendance, and it is her duty to carry out the treatment that has been prescribed.

The treatment of tonsils and adenoids differs from the other forms of treatment mentioned. Simple though the operation necessary for the treatment of these defects is, there is always an element of risk. Again, there is not quite the same sort of objection to this treatment by hospital and dispensary surgeons. Treatment of errors of refraction is a weariness of the flesh when hours of it are added to the other work of the specialist. Operations for tonsils and adenoids are necessary, and a reasonable amount of this sort of work is not objected to by junior specialists. I feel that at present, at any rate, there is no need for Boards in large towns to make special arrangements for the treatment of these defects.

There remain two defects, the full treatment of which seems to call for close co-operation with the public health

authorities of the town, and these are scabies and uncleanness, especially verminous conditions.

Every school officer knows how difficult it is to cure scabies, especially when several members of a family are affected. Even when a real effort is being made to carry out the proper treatment, absence is often prolonged. Pupils suffering from scabies can be treated by the school nurse at the treatment centre, but inquiry into home conditions often reveals the fact that either the younger members of the family under school age or the adults are suffering from the same trouble, and so re-infection of pupils is constantly taking place. It is here that assistance should be got from the public health authorities. They have power to deal with the other members of the family either beyond or under school age. With these treated and the necessary disinfection carried out, the cure of the affected pupil would be an easy matter for the school authorities.

The treatment of the uncleanly or verminous child calls for special co-operation with the Public Health Department. School authorities deal with such cases usually in something like the following manner:—Exclusion from school, with warning notice and full directions how to remedy the evil; visit from school nurse, with more instructions; re-examinations; statutory warning; summons before Board or prosecution by the Sheriff if necessary. In many cases by one or more of these steps the condition is remedied, but it is now more and more recognised that home conditions are responsible for most of these cases, and that there is little good got from the school authority treating the child unless the sanitary authorities deal with the home and other members of the family. The School Board and the sanitary authority must work together. This will throw an extra amount of work on the public health staff, but Boards can defray the expense of this extra work—~~or~~ the Board has already done so. With thorough disinfection of the home and other members of the family by the sanitary authorities, with treatment of the pupil through the school medical staff, a speedy cure of the evil can be secured, and any parent who allows the con-

dition to recur after the expenditure of all this effort must be punished.

The organisation of treatment in towns may thus be summarised—

(1) The provision or utilisation of already existing special schools and classes for certain groups of pupils unfit to attend ordinary schools.

(2) The provision of a centre for the special treatment of certain defects found in pupils attending school.

(3) The treatment at this centre by the school nurses, under the supervision of the school doctor, of what are known as minor ailments.

(4) Co-operation with the public health authorities in the treatment of uncleanness.

DISCUSSION.

Dr. Ernest T. Roberts—In Glasgow the work done during the last six months has included the treatment of the following conditions:—(1) Decayed teeth are treated at the Board's two centres. (2) (a) Eye diseases at one of the centres; (b) defective vision at the schools, and occasionally at the chief centre. (3) Skin diseases, including the X-ray treatment of favus and ringworm, at the chief centre. (4) Ear diseases, especially otorrhœa, are treated at the schools; the cases are examined by the medical officer; the treatment he advises is carried out by the nurses until a cure is effected, which satisfactory result is brought about in a large percentage of cases in a comparatively short time.

I suggest that adenoids and tonsils should be treated at the centre in the early morning; they should remain during the day under the care of a nurse or nurses, and be sent home in the evening in charge of their parents. The very few cases unfit to go home that evening might be accommodated in one of the hospitals. This method of treating adenoids and tonsils is that which usually obtains in the hospitals, and already has been adopted in some school clinics.

X.

THE MEDICAL TREATMENT OF SCHOOL CHILDREN IN COUNTIES.

By J. MAXWELL ROSS, M.A., M.B., B.Sc., Medical Officer of Health and Chief School Medical Officer, Dumfriesshire.

THE following notes on the organisation of medical treatment of school children in rural areas are largely the gist of conversations with my assistants, Drs. Thomson and Picken. They do not pretend to submit a definite scheme, and are put together, I fear, rather hurriedly, but may serve as a basis for discussion.

The problem is as pressing in rural districts as in towns, and the need for some organisation is shown in most of our reports. Whether from apathy, poverty, or other causes, a large proportion of children whose defects are notified to parents are found with these neglected. In our second report for Dumfriesshire we give the results of re-examination of 1031 children, regarding whom defects were notified to parents during the school year 1911-12. Of the 1031, 606; or nearly 59 per cent., were attended to, 425, or 41 per cent., neglected.

Certain of the schools, those situated in the burgh of Dumfries, showed an even worse state of affairs. The children in them notified to have defects requiring medical attention were 346. Of this number, 145, or nearly 42 per cent., had been attended to; 201, or 58 per cent., had been neglected. An analysis of the 425 cases neglected showed that 236, or 55·5 per cent., suffered from defective vision; 22, or 5·2 per cent., from other eye defects; 43, or 10·1 per cent., from ear defects (deafness, otorrhoea, &c.); 115, or

27·1 per cent., from enlarged tonsils or adenoids; 9, or 2·1 per cent., from other defects.

These figures do not include the cases of pediculosis, of which there were 277, of whom 57, or over 20 per cent., were found with the same condition on re-examination. Nor do they include cases of dental disease. These are so overwhelmingly numerous (88 to 89 per cent. of the total number examined) that no attempt is made to notify parents. Each child, whether the teeth are carious or not, is handed a card, as is, I believe; done in most other areas, on which is printed simple directions as to the care of the teeth. (I may say, parenthetically, that no advice is given to avoid the use of sugar.) In cases where the teeth are bad the children are advised individually and verbally as to the importance of seeing a dentist.

Inspectors who have experience of rural areas will agree that the defects most likely to be neglected are those of teeth, eyes, ear, throat, and nose. Skin diseases in Dumfriesshire, at least, present a much less urgent problem for us. Of 6325 children inspected during the past year, 80, or 1·3 per cent., were found to be suffering from such conditions, and of these not more than 11 showed evidence of ringworm. It is therefore on defects of teeth, eyes, ear, throat, and nose that I incline to focus attention.

There may be some legitimate difference of opinion as to whether dental or eye diseases are the more important from the medical inspector's point of view. Eye defects appear to interfere more actively with the child's progress in school; but as diseases of the teeth must have a greater influence on nutrition, and are more widely prevalent (there being 88 to 89 per cent. of children with carious teeth to 8 or 10 per cent. with defective vision), I am inclined to agree with those who consider the dental problem the more pressing.

How is the problem to be met? Some valuable hints may be got from the annual reports of the medical officer of the Board of Education, more particularly the second (1909). It is there pointed out that the extent of the disease is such that it is impossible to grapple with it as a whole. Some

selection must be made. Fortunately, very clear guidance on this may be got from the statistics already accumulated. These show that "the number of decayed permanent teeth increases rapidly up to the age of eight, especially considering the few that are erupted at that age, and the number is nearly double at the age of eleven." From the Birmingham school report a set of tables and quotations is taken indicating that, "at the age of six years, 74 per cent. of children were found to have sound dentition, while 3 per cent only had unsavable teeth. So rapidly does the proportion of unsavable teeth to sound teeth increase, that by the time the thirteenth year is reached less than 12 per cent. have sound teeth, while nearly 71 per cent. have one tooth or more decayed beyond possible repair." The six to eight age period, when the permanent teeth are erupting, would thus appear to be the critical point of attack. Treatment at this time would be conservative and preventive, and it is the period that should be chosen if the disease cannot, as, I think, we all agree, be grappled with as a whole, at least at the present time. Any work done in children of this age should, however, be subject to re-inspection at least once every year.

The arrangements to be made for overtaking the work must differ according to locality, and it is evident that they cannot be the same in rural areas and in the towns. School dental clinics cannot be established in the rural elementary schools. Dental hospitals are not available. Even where there are dental clinics attached to county hospitals, it will be found impossible to make such arrangements as would secure the attendance of all the necessitous children at them. Though school dental clinics cannot be established, the dentist may be brought to the school. This may be effected by the employment of whole- or part-time dentists attached to the staff of the school medical officer. A good deal might be said as to the relative merits of whole- and part-time appointments. As an example of part-time work, Dr. Newman quotes the Somersetshire scheme, and of whole-time the Dorsetshire scheme. Under the former ten dentists in

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different parts of the county expressed their willingness to treat school children on certain specified terms, the work to be done, where possible, in the surgery of the dentist, or, if this is not possible, in a room either in the school or its neighbourhood provided by the school managers or others, and furnished with an arm-chair with high, padded back, the dentist to bring his own appliances. The scheme is defective in that it does not provide for inspection other than that made by the medical inspectors, and I am not clear that it has come to fruition, as there does not appear to be further mention of it, and in the report for 1911 (page 157) the local education authority for Somerset are stated to have provided a whole-time dentist. The Dorsetshire scheme is a voluntary one, a whole-time dentist being appointed through the generosity of two private donors. The work was commenced in 1910. An area of the county was selected, and the dentist worked from convenient centres, taking the necessary apparatus with him from centre to centre. In the report for 1911 the general arrangements are described as follows:—

“A classroom was set aside as a surgery, and the following articles were provided by the managers or head teachers:—Jug of water, basin and towel, kettle of water, small table and tumbler.

“All instruments and apparatus were brought by the dentist. The children who applied for examination were in turn called from their places in class into the room. There was thus very little disturbance of the ordinary school routine. The children who required no treatment returned at once to their respective classes; the others were treated at once, except those whose defects necessitated treatment under gas. These were directed to return at a later date.

“The gas cases were dealt with, as a rule, on Saturday mornings, usually at some convenient central school, the anæsthetic being administered by such resident doctors in the place as were willing to undertake the work. A fee of one guinea was paid them for a morning or afternoon of two hours or less.”

During the year 1299 children from ninety-nine schools were treated. 2916 teeth were extracted (742 under general anæsthesia), and 592 fillings made.

The plan I favour at present for such a county as Dumfriesshire is the appointment of a whole-time dentist, whose duties would be to visit all the elementary schools, inspect the dentition of each child as far as possible, and select cases for treatment, concentrating particularly on the six-eight age period. The treatment, where possible should be given at the school, and cases that cannot be so treated should be advised to come to a convenient centre, *e.g.*, the secondary or intermediate education centre of the area, where a small dental clinic could be established. The dentist might also be expected to give the children and their parents general instruction as to the hygiene of the mouth and the prevention of caries. Such a scheme, if properly carried out, must in time greatly improve the general nutrition of the people, and so prove an important factor in the diminution of tuberculosis and other preventable ills of mankind.

The importance of eye defects does not require to be enlarged upon. From 8 to 10 per cent. of the children examined are found to have defective vision to such an extent as to require reference to an oculist, but this oculist is not readily attainable, and too many cases are being sent to opticians who have no doubt some skill in fitting glasses to correct the simple errors of refraction, but who may be quite unable to decide whether the defective vision is due to an error of refraction or to some other cause. The oculist should be available for all children who are found defective by the medical inspectors. Some inspectors are no doubt quite capable of undertaking refraction work, but at present inspectors have not too much time at their disposal, and those of us who are chief inspectors cannot hope to have always with us men who are equally proficient in the routine of school inspection and the estimation of refraction errors. It would therefore seem preferable that this work should be reserved for the expert. At present a number of our children

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are taken to experts in Glasgow, Edinburgh, and Carlisle, but the cost of a visit to these, in addition to the cost of glasses prescribed and purchased under ordinary conditions, is prohibitive to a large proportion of the rural population, and is probably the main cause of the neglect, which in Dumfriesshire amounts to 55 per cent. An arrangement should be made for the visits of an expert to centres to which children found defective might be brought for further and more complete examination. If glasses are prescribed, they should be provided at a charge which parents can meet. According to the English reports, the average cost of spectacles is stated as from 2s. to 3s. 6d. a pair. Many parents would be able to afford this, and the more necessitous might very well be assisted. The work of the oculist will not end with the prescription. As Dr. Newman points out, "It is necessary to ascertain that the glasses are correctly measured, actually procured, rightly fitted, and regularly worn, and, further, to secure that the child is re-examined at suitable intervals." Nor is this all. His advice should be available on such questions as the lighting of schools and other matters, *e.g.*, the school books, blackboards, maps, &c., which may affect the vision of the child.

The percentage of school children suffering from defects of ear, throat, and nose varies greatly in different areas. It may be that the differences in defects of hearing depend to some extent on the personal equation of the examiner. In Dumfriesshire the percentage with deafness is a little over 3. In the table, on page 42, of the report for 1911 of the Chief Medical Officer of the Board of Education, the percentages with slight defect vary from .57 in Rochdale to 14.3 in Brighton, with marked defect from .03 at Kingstown-on-Hull to 6.8 in Brighton. But the percentage of adenoids varies even more markedly, from 1.3 in Monmouthshire to 24.6 in Luton. Six county areas (Hereford, London, Middlesex, Shropshire, Somerset, and West Sussex) and four urban (Bradford, Darlington, Luton, and Nottingham) show percentages above 10. In Dumfriesshire the percentage is 5.7. The number of children suffering from this condition whose

parents have neglected notices sent them amounted in 1911-12 to 115, or 27 per cent. of the total number neglected. The proportion of ear defects neglected was 10 per cent. The importance of these conditions in relation to school life is too well recognised to be dilated on. There is a distinct case for expert assistance here also to be given on lines similar to those suggested for defects of vision. Not that operation will be necessary in all cases, but it will be in a very considerable proportion. It is now fully recognised that the operation in itself is not sufficient, that it is a distinct mistake to send children to a hospital simply to have redundant growths removed, and to think no more of them. Mouth breathing, for example, may persist, and, along with other uncorrected symptoms, may cause the recurrence of disease, which tends to throw obloquy on the operative measures adopted. After-care is as necessary as the operation itself, and it is here that the assistance of school nurse and teacher is of special value, that of the nurse in supervising the attention that should be given to the child for at least twenty-four hours after the operation, that of the teacher in instructing the children in suitable breathing exercises and conducting, as has been suggested by so many inspectors, the performance known as "handkerchief parade."

The mention of the school nurse leads me to say that we have not yet appointed one in Dumfriesshire, and that, so far as our experience goes, a nurse is not required to assist in the ordinary inspection work in our country schools. Without her I do not think any scheme of medical treatment would be efficient. Her services could be utilised with advantage in various directions, *e.g.*, (*a*) in visiting the homes of children of the poorer classes, to whose parents notifications of defects have been made, explaining the value of attention to the conditions named, and securing reference of them to the family medical attendants as far as possible; (*b*) in periodically revisiting homes of all children suffering from otorrhœa, pediculosis, &c., and seeking to secure maintenance of treatment; (*c*) in educating the parents of post-operative adenoid cases in reference to after care; (*d*) in

investigating the home circumstances of "delicate" children not yet presenting disease, and endeavouring by improvement of hygiene and dietetic details to prevent its development; (c) in visiting schools without notice, and systematically examining the heads of the children.

An adequate scheme for medical treatment in such a county as Dumfriesshire would therefore include as a minimum the appointment of a whole-time dentist, of part-time oculist, and part-time specialist in ear, nose, and throat diseases, along with one or more school nurses. Whether such nurses should be specially appointed, or whether arrangements might be made for utilising the services of district nurses, is a matter for future consideration, but at present I incline to favour the former method.

Defects other than those mentioned do not bulk largely in our lists of neglected cases. The majority of them appear to be readily submitted to the doctor's advice and care, so that special provision for them does not seem to be urgently called for. For the education of the blind, deaf and dumb, and mentally defective children the rural areas have to depend on institutions in the larger centres of population, and, whatever may happen as a result of legislation, this will likely continue to be the usual procedure.

Before I close, may I say a word in favour of the open-air school. Experience has shown that medically it is preventive, conservative, healing. County authorities are now being offered inducements in the form of generous grants to provide sanatoria for the treatment of tuberculosis. Part of the equipment of such institutions should certainly take the form of open-air schools, as, for example, is now done at the Bridge of Weir Sanatorium. But there is no reason why School Boards should not be urged to apply the principle to all schools under their charge, to arrange for more open-air work, and the conduct of classes in playground sheds. I should like to go further and suggest that the Education Department might do a most useful piece of work if it would set its architectural advisers to produce model plans of such schools for the information of Boards. It is recognised that

the buildings need not be expensive, and there are already types of sanatorium buildings and of shelters (for example, those used at Meathop, Westmoreland) which would give most useful hints. There should be much less difficulty in making this provision in county areas than in towns.

I have assumed in submitting these notes that facilities for the treatment of school children will be provided by the Legislature and the Treasury. When these are given the local educational authorities will be afforded an opportunity of laying a foundation for an incalculable improvement of the national health and welfare. Will they rise to it? I am enough of an optimist to believe that they will.

DISCUSSION.

Dr. William Bruce (counties of Ross and Cromarty) was all in favour of school clinics, but the money handed over to School Boards in scattered areas, if dealt with separately, is thrown away. It should be pooled or given for distribution by secondary education committees.

Dr. W. Jones Mackinnon (Lanarkshire) made reference to the overlapping that takes place where there is no co-operation between the school medical officer appointed by the County Secondary Education Committee and the specialist appointed by individual School Boards in the same area. Specialists—dentists—have been appointed by a number of School Boards in the county of Lanark to treat the teeth of school children, but several of these dentists spend their time in visiting the school, accompanied by a secretary, and preparing cards with elaborate statistics. These dentists send notices to the parents, who have probably received notice from the school medical officer the day before. He expressed the opinion that this was spending in inspection the money granted by the Department for treatment. Reference was also made to the appointment of opticians and chemists to prescribe spectacles.

Dr. Brown (Ayr burgh)—With reference to the complaint

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that certain School Boards drew up schemes of treatment and appointed specialists (including dentists and oculists) who acted independently of the school medical officer, I am strongly of opinion that no School Board should have the power to deal with any matter concerning medical inspection and treatment, either in open meeting or in committee, unless the school medical officer is present officially. This, of course, is more easily arranged in towns than in county districts. This can be met by the Department insisting that all matters concerning medical inspection and treatment should be subject to review by the County Education Committee, to whose meetings the school medical officer should be invited.

Dr. John Macintyre (North Lanark) said nurses were absolutely necessary for medical inspection. No teacher should be asked to take any part in the actual examination of the pupils. All weighing and measuring, vision testing, examining for uncleanness, &c., should be undertaken by the school medical staff. All that the teacher should be asked to do is to have the pupils presented, each with his record card filled up as regards name, address, age, &c. This not only applies in large schools, but also in the small rural schools. The pupils to be treated by the school dentist and the school oculist should be those cases which the school medical officer has, at the examination of the scholars, found to be defective as regards teeth and vision. In rural districts the smaller Boards might combine to have treatment which each Board separately would be unable to overtake. Or, the Secondary Education Committee of the County might undertake the treatment in those rural districts. Again, where one or two small School Boards adjoin a burgh School Board, the treatment of the pupils in the smaller Boards could be undertaken by the larger Board.

Dr. George Rose (Aberdeen School Board) said that, instead of being despondent at the result of our work, there was very good ground for satisfaction with the results already obtained in remedying defects and removing filthy conditions among our children. He referred to the importance of dealing thoroughly with

filthy conditions, and gave an account of the arrangement entered into between the School Board and the Town Council of Aberdeen for effecting this result, and advised its adoption where the need for cleansing existed. The plan had worked smoothly, and the result obtained was satisfactory. Indeed, this method seemed to be the only one that could be expected to get the desired cleanliness in the schools. Reference was made to his report for 1911.

Dr. Donald Murray (Stornoway)—As this has developed into a sort of “testimony meeting,” I should like to state briefly the modest beginning made in our district of Lewis. In three parishes, where medical treatment was difficult owing to the distance from the doctors, arrangements have been made for the parish doctors to visit the schools at intervals and attend to the defects found. The doctor is paid out of the treatment grant. Intimation of the doctor’s visit is sent to the parents, who are also informed that, if unable to pay fees, free treatment will be provided. But practically they all get it free. In these districts only 11 per cent. have one or more defective teeth. In the burgh of Stornoway the grant has been spent upon dental treatment and for spectacles. The teeth are much worse in the burgh. Out of about 250 notices sent, 70 agreed to having dental treatment, which, in the circumstances, is quite a good beginning. Treatment, however, will never be satisfactory until the present chaotic condition of medical service is changed into a comprehensive system embracing and co-ordinating all the medical activities now administered by different public bodies.

Dr. George Dick (county of Caithness)—I regret that Dr. Maxwell Ross confined his remarks largely to the treatment of what may be termed the grosser defects revealed by medical inspection. For the demonstration of those defects, *e.g.*, marked defects of vision, of hearing, of speech, &c., it is barely necessary to employ a medical practitioner. For the past forty years the existence of those cases in schools has been well enough known to education authorities, yet little or nothing has been done for them. The difficulty seems to be largely a financial one,

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and the same applies to treatment of most of the conditions referred to by Dr. Ross. If authorities had sufficient money to spend in treatment, most of the difficulties encountered in connection with those cases would disappear. It is otherwise with the more subtle conditions revealed on medical examination. Take, for example, malnutrition, pre-tubercular conditions, early tuberculosis, heart affections, &c. The purely medical aspect of those cases presents great difficulty, and in scattered rural areas adequate supervision of them is almost impossible. I should be glad to hear any suggestions Dr. Ross may have to make regarding the management of such cases. In reference to assistance given by teachers during the examination of pupils, I agree with what Dr. M'Intyre (Lanarkshire) has said. In small rural schools especially I think it is not desirable that the teacher should take any part in the examination of the child.

Dr. Maxwell Ross replied that he had been asked to speak, not so much on treatment, as the organisation of treatment in the rural areas. He did not think there was an organised scheme for treatment in any of the counties yet, and he would prefer to go slowly and work out a scheme which would prevent that lack of co-ordination between medical inspectors and other officials which apparently existed in some of the districts where individual School Boards had commenced partial schemes of their own. The discussion pretty clearly showed that schemes must be modified to suit the needs of different areas, and that, at present at least, there could not be strict uniformity all over the country. On the question of the need for a school nurse at inspection he was still unconverted. In Dumfriesshire the necessity for them had not yet arisen. No compulsion whatever was put on teachers to assist, but it was found that the great majority at any rate (he did not think they had one refusal) appeared to be glad to do so, and it certainly gave them an interest in the work which they might not otherwise secure, and that interest lead to a hearty co-operation. There was no doubt whatever that a great part of the success of medical inspection depended on this co-operation, and,

if teachers were willing to assist, why should they not be allowed to do so? . They were not, however, expected to test eyesight or examine for pediculosis. He did not argue that the system would necessarily work well all over the country, and could not speak for the larger centres of population, but was satisfied that it was a great help in the smaller schools. So far as treatment was concerned, the services of a nurse would be invaluable. No scheme would be complete without her. As to sanitary reports on schools, he could say that these were not dealt with as described by one of the speakers. With the co-operation of His Majesty's Inspector they could get any real improvement that it was necessary to make. He did, however, think that the discussion showed that there were distinct arguments in favour of larger School Board areas, or, at least, delegation of some of the duties and powers to a central committee.

At the close Dr. Cruickshank suggested that steps might be taken to hold a three-weeks course of physical training for medical officers in Edinburgh some time in the course of the summer. A majority of members intimated their willingness to attend such a course.

Votes of thanks concluded the proceedings.

APPENDIX.

SEDERUNT AT CONFERENCE.

Name.	Qualifications.	Official Designation.	Authority by whom employed.
Alexander, Bethia S.	M.B., Ch.B., D.P.H.	Asst. Sch. Med. Off.	County of Fife
Ash, R. V. C.	M.B., D.P.H.	Med. Off. and Lecturer in Sch. Hygiene	St. Andrews Prov. Com.
Bell, J. Clark	M.B., Ch.B., D.P.H.	Asst. Med. Off.	Carnegie Dunfermline Trust
Brown, G. Arbuckle	B.Sc., M.B., D.B.P. (Camb.)	Principal Med. Off.	Govan Parish Sch. Bd.
Brown, Walter F.	M.B., C.M. D.P.H. (Camb. and Edin.)	Sch. Med. Off. and Med. Off. of Health, Ayr	Ayr Burgh Sch. Bd.
Bruce, Robert	M.B., Ch.B.	Asst. Sch. Med. Off.	Glasgow Sch. Bd.
Bruce, William	M.D., LL.D.	County Med. Off. and Chief County Med. Inspector of Schools.	County Council of Ross and Cromarty and Sec. Educ. Com. for Ross and Cromarty
Buchanan, G. G.	M.B., B.Sc., D.P.H.	County M.O.H. and Sch. Med. Off.	County Council of Haddington
Cairns, James W.	M.B., Ch.B., D.P.H.	Asst. Med. Off. of Health and Sch. Med. Off.	County Council of Ayr
Cameron, Isabella D.	M.D., D.P.H.	Med. Off. and Lecturer in Sch. Hygiene	Edinburgh Prov. Com.
Cameron, James A.	M.D., B.Sc.(P.H.)	M. O. H., and S.M.O., Nairnshire	County Council and Sec. Educ. Com. of Nairnshire
Cathel, Mildred M. L.	M.B., Ch.B., D.P.H.	Sch. Med. Inspector	County Council of Dunbarton
Clark, George S.	M.A., M.D., B.Sc.(P.H.)	Asst. Sch. Med. Off.	Edinburgh Sch. Bd.
Clark, Katherine S.	M.D., D.P.H.	Asst. Sch. Med. Off.	Edinburgh Sch. Bd.
Cruikshank, L. D.	M.D., D.P.H.	Med. Off.	Scotch Educ. Dept.

Name.	Qualifications.	Official Designation.	Authority by whom employed.
Darling, William	M.A., M.B., F.R.C.S.E.	Med. Off.	Edinburgh Prov. Com.
Davidson, Davidina, R. J.	M.B., Ch.B., D.P.H.	Asst. Sch. Med. Off.	Glasgow Sch. Bd.
Dick, G.	M.B., B.Sc.	County Med. Off.	County Council and County Sec. Educ. Com., Caithness Renfrewshire Educ. Com., Area 2
Donald, Robert	M.D., D.P.H.	Sch. Med. Off.	Glasgow Prov. Com.
Douglas, Carstairs	M.D., D.Sc., F.R.S.E.	Med. Off.	Elgin County Council and Elgin-shire Sec. Educ. Com.
Douglas, Robert	M.A., M.B., D.P.H.	County Med. Off. of Health and Sch. Med. Off.	Sec. Educ. Com. of Aberdeenshire
Duguid, Henry	M.B., Ch B., D.P.H.	Asst. Sch. Med. Off.	County of Clack-mannan
Finlater, C. C.	M.D., D.P.H.	Sch. Med. Off. and County Med. Off.	Sec. Educ. Com. of Inverness-shire
Fletcher, Duncan	L.R.C.P. & S. (Edin.), L.R.F.P.S. (Glas.), D.P.H.	Sch. Med. Off.	
Fraser, D. Munro	M.A.	H. M. Chief Inspector of Schools	Scotch Educ. Dept.
Fraser, Kate	B.Sc., M.B., Ch.B., D.P.H.	Asst. Sch. Med. Off.	Govan Parish Sch. Bd.
Fraser, Mark S.	M.D., F.R.C.S. (Edin.), D.P.H.	Asst. Med. Off.	Carnegie Dunfermline Trust
Gardner, A. Josephine	M.B., Ch.B., D.P.H.	Sch. Med. Inspector	County Council of Stirling
Garrey, Gilbert	M.B., Ch.B., D.P.H.	Asst. M.O.H. and Sch. Med. Off.	County Council of Ayrshire
Gerrard, William I.	M.B., D.P.H.	Asst. Sch. Med. Off.	Aberdeen Sch. Bd.
Gillies, Patrick, H.	M.B., C.M., B.Sc.	Sch. Med. Off.	Argyleshire Sec. Educ. Com.
Gilmour, A.	M.D., M.R.C.P.E., D.P.H.	Sch. Med. Off.	Paisley (Burgh) Sch. Bd.
Glass, Alexander G.	M.D., D.P.H.	Sch. Med. Off.	Sec. Educ. Com. of Roxburgh and Selkirk
Grant, Alexander	M.B., C.M., B.Sc.(Hyg.)	Sch. Med. Off.	Sec. Educ. Com., Banffshire
Heddle, R. P.	M.B., C.M., D.P.H.	County M.O.H. and Sch. Med. Inspector	County Council of Orkney

Name.	Qualifications.	Official Designation.	Authority by whom employed.
Hunter, John	M.B., Ch.B., D.P.H.	Med. Inspector of Schools.	Linlithgowshire Educ. Com.
Jardine, John	M.D., D.P.H., F.R.C.S.E.	Med. Inspector of Schools	Midlothian and Peebles Educ. Com.
Johnston, J. Gair	M.B., Ch.B., D.P.H.	Sch. Med. Off.	Kirkcudbright- shire Sec. Educ. Com.
Kidd, A. E.	M.B., C.M., D.P.H.	Chief Sch. Med. Off.	Dundee Sch. Bd.
King, Robert	M.D., D.P.H.	Sch. Med. Inspec- tor	Kincardineshire Sec. Educ. Com.
Livingstone, Donald M.	M.D., B.Sc.	Sch. Med. Off.	Dunbartonshire Sec. Educ. Com.
MaeBean, A. F.	M.A., M.B., Ch.B., D.P.H.	Asst. Med. Off.	Counties of Fife and Kinross
Macintyre, John	M.B., Ch.B., D.P.H.	Sch. Med. Off.	Lanarkshire (North Division) Sec. Educ. Com.
Mackenzie, Alister T.	M.A., M.D., D.P.H., F.R.S.E.	Administrative Med. Off.	Carnegie Dunfer- line Trust
Mackenzie, W. Leslie	M.A., M.D., LL.D., F.R.S.E.	Med. Member of Local Govern- ment Board	
Mackinnon, William Jones	M.D., D.P.H.	Sch. Med Off.	Lanarkshire (South Division) Sec. Educ. Com.
M'Iloy, Janie H.	M.B., Ch.B., M.A., D.Sc., D.P.H.	Asst. Med. Off.	Glasgow Sch. Bd.
M'Whan, A. A.	M.B., B.Sc., D.P.H.	County M.O.H. and Sch. Med. Off.	County Council and Sec. Educ. Com. of Berwickshire
Meikle, J. Hally	M.A., B.Sc., M.D., D.P.H.	Chief Sch. Med. Off.	Edinburgh Sch. Bd.
Middleton, G. G.	M.B., Ch.B., D.P.H.	Sch. Med. Off.	County Educ. Com. of Ross and Crom- arty (Div. A)
Moffat, G. E.	M.B., D.P.H.	Inspecting Sch. Med. Off.	County of Perth
Munro, A. Campbell	M.B., D.Sc.	M.O.H.	Renfrewshire
Murray, Donald	M.B., C.M., D.P.H.	Sch. Med. Off. District M.O.H. (Lewis)	County Educ. Com. of Ross and Crom- arty (Div. B)
Nicol, Patrick	M.D., D.P.H.	Chief Sch. Med. Off.	County Com. on Sec. Educ. of Aberdeenshire
Pattison, P.	M.B., D.P.H.	Asst. M.O.H.	County Com. of Fife
Pirret, Mary	M.D., D.P.H.	Sch. Med. Off.	Sec. Educ. Com. of the County of Wigtown

Name.	Qualifications.	Official Designation.	Authority by whom employed.
Richardson, George Y.	M.B., Ch.B., D.P.H.	Asst. M.O.H. and Sch. Med. Off.	County Council of Ayr
Ritchie, James	M.B., C.M., M.D., F.R.C.P. and S.(Ed.), M.R.C.S. (Eng.)	Sch. Med. Off.	Governors of Geo. Heriot's Trust.
Robb, Alexander	M.D., D.P.H.	M.O.H. and Chief Sch. Med. Off.	Counties of Mid- lothian, Linlith- gow, and Peebles
Roberts, Ernest T.	M.D.(Edin.), D.P.H. (Cantab)	Chief Med. Off.	Sch. Bd. of Glasgow
Robertson, J. L.	LL.D.	H.M. Chief Inspector of Schools	Scotch Educ. Dept.
Rose, George	M.B., C.M., D.P.H.	Chief Sch. Med. Off.	Aberdeen Sch. Bd.
Ross, J. Maxwell	M.A., M.B., F.R.C.S., J.P.	County M. O. H. and Chief Med. Inspector of Schools	County Council and Sec. Educ. Com. of Dumfries
Scougall, A. E.	LL.D.		
Sinnette, Malcolm B. G.	M.B., Ch.B., D.P.H.	School Med. In- spector	Greenock Sch. Bd.
Skinner, Grahame H.	M.B., Ch.B. (Edin.), D.P.H. (Camb.)	Asst. Sch. Med. Inspector	Stirlingshire Sec. Educ. Com.
Sloan, Archibald	M.B., C.M.	Med. Off.	Glasgow Prov. Com.
Stooke, Jessie J.	L.R.C.P. and S., D.P.H.	Asst. Sch. Med. Off. and Lec- turer in Physi- cal Training.	Carnegie Dunferm- line Trust
Stuart, Charles	M.D.	Sch. Med. Off.	Perth Sch. Bd.
Thomson, A. B. M.	M.B., Ch.B., D.P.H.	Asst. Sch. Med. Off.	Dundee Sch. Bd.
Thomson, Thomas Lauder	M.D., D.P.H.	Supervising Sch. Med. Off.	Sec. Educ. Com. of Dunbartonshire
Walker, Arthur S.	M.B., Ch.B., D.P.H.	Sch. Med. Off.	Leith Sch. Bd.
Williamson, George A.	M.A., M.D., D.P.H., D.T.M.	Med. Off. and Lecturer in Hygiene	Aberdeen Prov. Com.
Yule, G. Pratt	M.D., B.Sc., F.R.C.P., M.B., C.M.	Principal School Med. Off.	County Educ. Com. of Fife



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